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PEDIATRICS for NURSES

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TO
THE MEMORY OF
MY FATHER

FRANK BALDWIN, M.D.
THIS BOOK IS
REVERENTLY DEDICATED



PREFACE

This is the age of the child. To-day perhaps more than ever before our attention is focused on the physical and mental health of the new generation.

When one thinks that in civilized countries at least one child in every ten dies during the first year, and that fully one-half of these deaths are preventable by proper feeding and care, one realizes what an opportunity pediatrics affords for constructive medical work.

With this interest in children, pediatrics has become definitely separated from general medicine. It occupies itself as much with the well child and the preservation of health as it does with the sick child. We are learning what food and what care are necessary to give the child a fair start in life. And this knowledge requires for its application physicians and nurses with special training.

This textbook is the outgrowth of a series of lectures on pediatrics which the author has given for the past six years to the Intermediate Class of the Johns Hopkins Hospital School for Nurses. It is presented in response to many requests that the substance of these lectures be made more available by being put into book form. The lectures did not aim to give a complete knowledge of pediatrics; such knowledge can come only in the nursery, the hospital, the milk room, and the welfare clinic. They sought rather to give a framework of fact and practice about which the nurse could build up her body of experience. The same is true of this book.

A few points of explanation concerning the presentation of the material are necessary here. Preference has been given to the English system of weights and measures over the more scientific metric system. This has been done for very practical reasons. Few mothers in this country are familiar enough with the metric system to be much enlightened by the statement that the new baby weighs 3,500 grams, while 7½ pounds conveys a very definite idea to them. Furthermore the scales at our disposal outside of the laboratory are usually graduated in pounds and ounces. The same can be said with even more force with regard to infant feeding. We still buy our milk in quarts and pints, and our nursing bottles are still graduated in ounces. So there is no good purpose served by thinking and talking grams and centimeters when we handle pounds and ounces. Conveniently approximate metric figures are given for those whose preference lies that way.

In the same spirit, details of laboratory examinations such as blood-counts, serological and bacterial tests and procedures are omitted from the discussions of the various diseases, and emphasis is laid on that which the nurse herself can see or hear or feel.

Many diseases of childhood are not even mentioned while others are only touched upon in passing. This is because it has seemed wise to lay the emphasis on those conditions which require special nursing care, or in which the procedure is radically different from that employed with adults. In this connection the illustrations used are those which show nursing procedures rather than disease conditions.

In the selection of his material the author has been greatly aided by those nurses who in successive years have assisted him in the presentation of his lectures. To these and to Miss Ethel Sikes and Miss Helen Giddings who helped him in the preparation of the illustrations he expresses his profound thanks.

Finally to Dr. John Howland, Professor of Pediatrics at the Johns Hopkins Medical School, he acknowledges a debt of gratitude which he can never repay, for his teaching, his suggestions, and his help in the actual preparation of this volume.

JOHN C. BALDWIN

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CHAPTER I THE NORMAL INFANT



CHAPTER I

THE NORMAL INFANT

GROWTH

Growth is one of the most important functions of early life. In consequence, questions of growth make up a large part of the practice of pediatrics. To recognize a failure on the part of the infant or child to gain properly, a knowledge of his normal size and rate of growth at various ages is essential.

In what follows the distinctions between the terms "normal" and "average" must be kept clearly in mind. Thus of 100 normal newborn babies the weights may vary from 5 to 10 lb. (2,300 to 4,600 gm.); most of them, however, will weigh between 6 and $8\frac{1}{2}$ lb. (2,750 and 3,850 gm.), while the average of the whole group will be about $7\frac{1}{4}$ lb. (3,500 gm.). In other words, a child may vary considerably from the average and still be normal.

Birth Weight.—Boys as a rule weigh slightly more than girls. The average weight of boy babies is 7½ lb. (3,500 gm.), while that of girls is 7 lb. (3.250 gm.). Those weighing under 5 lb. (2,300 gm.) fall into a special group known as "Premature Babies."

Early Loss of Weight.—Soon after the baby is born he starts to lose. This initial loss is due to a number of factors, loss of urine, of meconium and of the superficial layers of skin being among the most important. About 10 oz. (300 gm.) are thus lost in the first three or four days. During these early days the food which is received from the mother, and which is called colostrum, is scanty, so that the baby receives but

little nourishment. With the arrival of true milk in the breasts, however, this loss stops and the child begins to gain. His early gain is almost as rapid as was his loss, and by about the tenth day the normal infant has regained his birth weight.

Growth During First Year.—Once he has started to gain the normal infant's weight should show a steady increase. A gain of 4 or 5 oz. (100 to 150 gm.) a week is considered satisfactory. With such a gain the baby will about double his birth weight in the first six months and triple it in a year; that is, he should weigh from 14 to 15 lb. (6,500 to 7,000 gm.) at six months, and from 20 to 21 lb. (9,000 to 9,500 gm.) when a year old. It frequently happens that vigorous breast-fed infants with an abundant supply of milk gain much more rapidly, an increase of 2 oz. (60 gm.) a day being not uncommon. But it must be remembered that overfat babies are not to be desired, and one should be quite content with a consistent gain of 4 oz. (100 gm.) a week. But a uniform gain after the first year is rather the exception. It is far more common for a child to gain rapidly in the spring and fall, and show only a very gradual increase during the heat of the summer and the shut-in periods of winter. During the third year there is a gain of 4 lb. (1,900 gm.), which rate is approximately maintained until the tenth year, when the child weighs in the neighborhood of 60 lb. (27.5 kg.). At twelve years the average weight is 78 lb. (35.5 kg.), with girls slightly heavier than boys for the only time in their career. This is due to the fact that puberty is reached somewhat earlier in girls than in boys, and that with puberty there is a sudden and considerable acceleration in the rate of growth.

Variations in Weight.—By far the greatest departures from average weights are due to feeding. The underfed child is always under weight; or the feeding may bring on intestinal disturbances which cause the child to lose. Diseases of almost every nature have their effect upon weight; minor ailments—such as a simple cold in the head—usually checking the rate

of gain appreciably, while severe illnesses—such as prolonged intestinal disturbances or whooping-cough—exert a profound effect on the weight. Heredity, which plays such an important part in determining the stature and bulk of the adult, does not figure so prominently as a factor in children, and ranks below both feeding and disease in determining the weight.

Height.—While the length of the body is not nearly so important as the weight, and is much more constant, still it is necessary to be familiar with the normal. At birth the average length is 20½ in. (50 cm.). Babies under 19 in. (47 cm.) usually weigh under 5 lb. (2,300 gm.) and are classed as premature. During the first year the child gains about 8 in. (20 cm.), during the second year $3\frac{1}{2}$ in. (8 cm.), and from then on about 2 in. (5 cm.) each year until puberty is reached, when he shoots up rapidly.

Variations in Height.—Certain diseases have a marked effect in retarding the growth of children. Of these, rickets is the most common, while cretinism and a number of rarer conditions also limit growth. The effect of these diseases is noticed principally in the length of the extremities, which in childhood grow much faster in proportion than the trunk. Heredity plays much more of a part here than in the weight of the child, the offspring of tall parents tending to grow faster than those of short parents. Feeding has relatively little influence on the height, however, and it is not unusual to see a child who is losing weight during some prolonged illness, actually increase in length at the same time.

The Head.—At birth the head measures $13\frac{1}{2}$ in. (34 cm.) in circumference. By the end of the first year this has increased to $17\frac{1}{2}$ in. (44 cm.)—a gain of 4 in. (10 cm.).

During the second year, I in. (2.5 cm.) is added, after which growth is very gradual, being only about ½ in. (1.25 cm.) a year until the eighth year, when the head is nearly of adult circumference. The very rapid growth in the skull of the infant is made possible by its peculiar structure. Instead of

being a continuous bony shell, it is made up of islands of bone, surrounded by cartilage. These plates, which correspond to the various bones of the adult skull, are but loosely fastened where they meet in the so-called sutures. These sutures are so pliable that at birth the edge of one bone often overrides another, thus aiding materially in the molding of the head, which is necessary in its passage through the birth canal. Where the two frontal and two parietal bones meet, there is a diamond-shaped, soft spot, known as the anterior fontanel. This lies in the midline under the forward part of the scalp, and can be seen to move gently up and down with each heart beat. Similarly, where the parietal bones and the occipital bone come together, there is a smaller, triangular soft spot, known as the posterior fontanel. This latter normally closes by the end of the second month, while the anterior fontanel gradually decreases in size until it finally disappears at about the eighteenth month. The closing of the fontanels is delayed in rickets, cretinism and hydrocephalus. It is apt to be early in malnutrition and microcephalus.

The softness of the baby's skull must be kept in mind by the nurse. Some infants show a marked preference for lying on becomes misshapen, with the side on which the child lies one side, and will twist and turn until they get in the desired position. If allowed to continue in such a habit the head flattened. So one must be careful to turn the baby from side to side, and, if the head does become flattened, take pains to keep him lying on the opposite side.

MUSCULAR DEVELOPMENT

Chest and Abdomen.—These are of about the same circumference as the head until the second year, when the chest grows faster than either, and the abdomen faster than the head. The health of the baby during the early years has a great influence on the chest: rickets, tuberculosis and nasal obstruc-

tion producing changes, not only in its size but in its shape and symmetry, which, however, are not apt to be permanent.

A baby at birth is unable to make any voluntary movement. What coördinated movements he makes—such as breathing and sucking—are entirely involuntary reflexes. The hands and feet move aimlessly, while the head can scarcely be moved at all and unless supported falls heavily to one side. It is usu-

ally three or four months before the neck is strong enough to support the head when the infant is held upright. This fact must be remembered when handling the baby; when holding him over the shoulder, for example, one hand should be kept high up on his back, with the head supported by the thumb and the first two fingers. By four months also, many babies attempt to grasp objects. At first this is a very clumsy process as the baby has no idea of distance, and his muscles work together very poorly. He will reach for the Fig. 1.—Carrying the Infant. The head is supported so as to relieve the neck from strain. it as he will his father's watch. It



is not long, however, until he becomes more adept and can pick up and wield his rattle in the most approved manner.

At six months the baby shows a desire to sit up, and by seven months can usually sit unsupported for several minutes.

Soon after this many babies start to creep. Creeping is not a normal method of locomotion for the human race, and not a few babies never practice it. Those who do may adopt any of a number of different styles. Some go on hands and feet,

some on hands and knees, while still others sit and hunch themselves along with heels and hands.

Between the tenth and twelfth month most babies learn to pull themselves up and to stand with support.

The age at which they begin to walk varies greatly. I have known one baby who walked well at nine months. In general boys walk somewhat earlier than girls, and thin babies walk earlier than those who are overweight. The average age for walking unassisted is one year. It must be remembered that when the bones and muscles are strong enough the baby will stand and walk. In consequence, it is foolish to try to teach a child to walk. This only puts his legs under a strain which they are not yet ready to bear, and may easily result in bowlegs or knock-knees in children suffering with rickets.

SPEECH

Most babies will begin to talk at about one year. The first intelligible words are usually "mama" and "papa"; soon they acquire other proper names, then the names of objects. By two years they are usually putting words together into sentences. A child who makes no effort to talk at this age should be carefully examined to determine whether he may be a deaf-mute. If he can hear but does not talk, it is very probable that he is mentally retarded. One should never encourage a child to continue the use of "baby-talk" by imitating him. Always speak as distinctly as possible so that he may imitate you, for bad habits of speech soon become fixed and are embarrassing both to child and parent, when they persist to the school age, as they frequently do if not firmly checked.

SPECIAL SENSES

Our senses—sight, hearing, touch and the rest—are the most delicate of mechanisms, and it takes the newborn infant some time to get them into working order.

Sight.—It is usually three or four months before the eyes move in unison, and a mother with her first-born has hours of dread, when she sees the baby's eyes wandering quite independently of each other, for fear her child will be crosseyed. Even the lids do not function properly, and it is not uncommon to see a normal infant sleeping with eyes half open. The eyes are also unduly sensitive to bright light and the infant appears distressed when exposed to it. This must be kept in mind in caring for young babies. In the nursery, the infant should be protected from the direct rays of the sun, and when out in his carriage the hood should be lowered on bright days.

Hearing.—The child is practically deaf at birth, but he soon begins to hear, and by the time he is a month old will jump, as though frightened, at any sudden noise. By the time he is six or seven months old he can recognize familiar voices.

Pain.—The senses of touch and pain are very dull at first, so much so that minor surgical operations—such as circumcision—can readily be carried on without an anesthetic.

Taste.—Of all the senses taste seems to be the best developed at birth. I knew one baby who would not take water from the city supply, but would drink that from a spring in a near-by park. And I was never able to fool him by changing the bottles and nipples from which the two samples were taken.

Smell.—The sense of smell develops late; it is said that finer distinctions are not made until late in childhood.

TEETHING

The Teeth.—At birth the teeth lie against the jaw bones, deep in the gums. Soon after birth the roots begin to grow and press against the jaw. This forces the crowns upward toward the gum margins. Little by little they work their way through the firm tissues and finally break through the mucous

membrane. The first teeth to appear are the lower middle incisors, which usually come through at about the sixth month. At from eight to twelve months the four upper incisors appear. At one year of age the child will thus have six teeth. During the next three months he gets the lower lateral incisors and the first molars. This leaves a gap, which is filled at from eighteen to twenty-four months by the canines, otherwise known as the eye-teeth (above) and the stomach-teeth (below). Finally between two and two and a half years, the

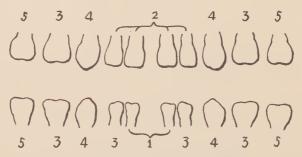


Fig. 2.—Diagram of Deciduous Teeth.

I. Lower middle incisors	6-8 months
2. Upper incisors	8-12 "
3. Lower lateral incisors and anterior molars	12-18 "
4. Canines	18-24 "
5. Posterior molars	24-30 "

four back molars come through. These twenty teeth constitute the first set, which are known as the deciduous or milk-teeth, and are all the child gets until he is about six or seven years old.

Difficult Dentition.—From what has just been said it is seen that from the time a child is born until he is two and one-half years old he is constantly in the process of teething. Formerly most of the ills to which a child fell heir during that period were laid to teething. If the baby had a convulsion, it was blamed on the teeth; if he had diarrhea or vomited, it was due to the teeth. Even to-day ignorant mothers will often complain that the baby always teeths with "running ears" or with

a "cough." However, as more has been learned about babies from year to year, one after another of these ailments has been shown to have its own particular cause, in no way related to the eruption of the teeth. So that now there remain but a few minor manifestations which can with any justice be attributed to teething. For a few days before the tooth actually breaks through the mucous membrane, the gums are red and swollen. During those days the baby may be slightly feverish and fussy and take his feedings poorly. But very often the first intimation which one has that the teeth are on their way is the appearance of the teeth themselves.

Irregular Dentition.—There are very wide variations from these normals. As a rule, breast-fed children teeth earlier and more easily than the artificially fed. Infants are sometimes born with teeth. This is unfortunate, as they often interfere with nursing and have to be extracted. Syphilitic children often teeth early, and the teeth are apt to decay long before the second set is ready to appear. Very many normal children get their teeth in a different order from that outlined above. In mentally defective children, the dentition is usually irregular in sequence, and is apt to be irregular in arrangement. In rickets, dentition is invariably delayed.

The Second Set.—The first of the permanent teeth to appear come in behind the second molars of the first set. They are known as the "six-year molars," from the time of their eruption. Then comes the ugly stage of childhood, when the second teeth pushing upward cause the first to loosen and drop out. First the permanent incisors replace the deciduous incisors. Then the second canines replace the first. The original molars have their places taken by eight bicuspids. Then behind the six-year molars come in the second molars, which usually appear at about fourteen years of age. Finally at about twenty years the third molars, or "wisdom teeth," make their presence known.

SLEEP

Hours.—The newborn infant spends practically all of his time in sleep. For the first two or three days the sleep is almost continuous. During the first six months he is awake but little, except for his feedings and bath, which means from twenty to twenty-two hours of sleep each day. At a year he should sleep twelve hours at night, with one interruption for nursing, and should take two naps, totaling two or three hours. By the time he is from fourteen to sixteen months the night feeding can usually be omitted, so that he has an unbroken sleep of twelve hours. At two years he will be taking but one nap a day, usually of about two hours, and will be sleeping from seven at night until six in the morning. The daily nap usually becomes difficult to obtain in the fourth year, and may be dropped, except in the case of high-strung, easily fatigued children, who should be required at least to lie down for a time after luncheon until they are six or seven.

Regular Habits.—Children vary in the amount of sleep they require, and one should always be sure that the child gets enough. He is very unlikely to sleep more than is good for him. It is extremely important that the child be trained early into regular habits of sleep, for nothing is so difficult as taking care of a child who insists upon turning night into day, as many of them will, if not properly trained. The baby does much better, as a rule, if he sleeps in a room by himself. At all events he must have a bed to himself. The practice of sleeping in the bed with the mother should be forbidden as dangerous and unhealthy. If a baby has been properly trained, all that is necessary at bedtime is to put him in bed, darken the room and leave him. A well baby who is dry, warm, and well-fed promptly falls to sleep. On the other hand, if he is accustomed to being rocked or sung to, he will not go to sleep normally, and makes constant and unnecessary demands on the time of his nurse. Such a child is particularly difficult

when some illness has made him fussy and wakeful. Then the rocking or walking becomes a continuous process.

The Bed.—For the first few months of life a bassinet is the best bed. It should be light so that it can be easily moved about and should be free from flounces and draperies, which are hard to keep clean and invite dust. A clothes basket, with a quilted lining and a fairly firm pillow as mattress meets these requirements well. It may be placed on two chairs to bring it to a convenient height. By two months the baby may graduate to a crib. The most convenient type is of white enameled iron, and has one or both sides so arranged that they may be let down. This enables the child to be cared for without reaching over a high side. If there is a choice, a higher crib is better than a lower, as one does not have to stoop so far in handling the child. For hospital use, where the patient has frequently to be examined, the crib in which the spring and mattress may be raised to the height of the sides, with the patient on them, is almost a necessity.

The bed should be made up with a rubber sheet, linen or muslin sheet and quilted pad under the baby; over him should be a sheet, enough warm, light blankets and a light spread. In cold weather a light quilt may be used in addition. A pillow, if used at all, should be thin. An ordinary pillowslip, folded until about ten inches square, serves admirably.



CHAPTER II THE CARE OF THE NORMAL BABY



CHAPTER II

THE CARE OF THE NORMAL BABY

At Birth.—The care of the infant at birth falls in the province of the obstetrical nurse, but an outline of that care may well be given here. As soon as the cord is tied and cut, a dry sterile dressing is applied to the stump. The child is then wrapped in soft, warm blankets and placed in a basket or other convenient place, and surrounded with hot-water bottles. There he is left until time can be spared from the mother to give him further care. From the moment of his birth, however, the baby must be watched to be sure that he cries vigorously and breathes well. At the first suggestion of cyanosis or shallow, insufficient respiration, the baby must be made to cry. The importance of this will be further emphasized in Chapter X. As soon as the time can be spared, further attention is given the child. The skin, which at birth is covered with a sticky coating known as the "vernix caseosa," is carefully cleansed with olive oil on soft cloths. This should be done in a warm room, preferably before an open fire, and with as little exposure of the baby as possible. The mouth is then cleansed with sterile water and sterile pledgets of cotton. Finally, and most important of all, the physician should drop into each eye one or two drops of a fresh 2 per cent solution of silver nitrate. It is not always an easy matter to get the drops into an eye which the infant instinctively keeps tightly closed. But one should never be satisfied until he is certain, beyond any doubt, that he has actually succeeded in getting the solution into the eye. There is no possible excuse for failure to carry out this step satisfactorily, as it is harmless in itself, and, if neglected, may and often does lead to blindness. The nurse should never hesitate to remind a physician of his oversight, if through carelessness or pressure of some emergency he has neglected to put drops into the baby's eyes.

After these details are attended to, the baby is weighed, measured, dressed and put in his basket, and placed in a quiet, warm, dimly lighted room. If he has shown the least indication of not breathing satisfactorily, he should be carefully watched. After six hours, if the mother has sufficiently recovered from her ordeal, the baby is placed at the breast. This should be repeated each six hours during the first day, and thereafter every four hours. Between feedings the baby may be given warm, boiled water, from ½ to 2 oz. (15 to 60 c.c.) if he is fretful.

The infant should not be given a tub bath until the cord has separated, which usually has happened by the eighth day, often by the fourth or fifth day.

The Bath.—In considering the daily bath, some discussion of the paraphernalia required is needed. In hospitals with their special warm rooms, with high table, tubs and sprays, the bath is simple, but in private homes considerable ingenuity is sometimes necessary to provide suitable surroundings for the bath.

It is well to have a white enamel tray or basin to hold small toilet articles. This is not as dainty-looking as the lace-trimmed bath baskets on the market, but it is just as convenient, much less expensive and very much more sanitary. On the tray should be:

Absorbent cotton pledgets in covered glass jar
Bottle or jar of boric acid solution
Small, enameled bowl
Bottle of albolene
Toothpick swabs in covered jar
Celluloid soap box
Box of baby powder
Tube of vaselin or bottle of olive oil

Assorted safety pins Scissors Hairbrush Bath thermometer

It is very tiring and unnecessarily difficult to give a baby a bath in the family bathtub. There are many useful types of infant tubs on the market, perhaps the best of which is made of rubber sheeting on a light, wooden frame. This tub may be folded and put away when not in use; when wanted, it may be set up on a table, or across the top of the family tub.

The room in which the bath is given should be warm and free from drafts. In cool weather, an electric heater is useful and furnishes a delightful glow.

The nurse should have a large apron of rubber sheeting to protect her uniform; over this should be a soft bath apron of outing flannel or stockinet. She should have a low, comfortable rocking-chair, without arms, in which to sit, and there should be a low table on which to place the bath tray. She requires several very soft, turkish towels or old bird'seye diapers, and two or three soft cloths for washing the baby.

The water for the bath should be clean and not too hard. Hard water is apt to make the skin crack and should not be used with young babies. In localities where the water is hard, one may either use rain water or boiled water for the bath. The temperature of the bath should not be guessed at. It should be measured with a bath thermometer and brought accurately to the desired point by pouring in hot or cold water as the case may be. If one has no thermometer, the bend of the elbow is a better guide than the hand, as its natural sensitiveness has not been impaired by frequent emersions in hot and cold water.

The temperature of the bath for the first two months should be 100° F. Subsequently this may drop a degree a month until at six months it is 95° F.; at one year, 90° F.

The soap used should be some bland, unscented, unmedicated variety. White Castile or Ivory are satisfactory.

Bath Preliminaries.—Immediately before the bath proper there are a number of minor details of the toilet which must be carried out. The nose should be cleansed of any crusts or mucus by the use of toothpick swabs dipped in albolene. Any secretion in the corners of the eyes, or on the lids, should be gently wiped off with a pledget of cotton soaked in boric acid. The attention of the physician should, of course, be called to any considerable discharge from the eyes. The mouth should not be cleansed. Thrush is very much more common in babies whose mouths are washed daily than in those whose mouths are unwashed. The outer ear may be cleansed, and any wax which oozes from the canal may be wiped away, but nothing should be introduced into the canal itself. The delicate structures of the middle ear lie so close and are so easily damaged that it is unwise to take any chances of injuring them. If the canal needs cleaning it should be done by the physician.

Toilet of Genitalia.—If the infant is a boy, the foreskin should be drawn back and the parts gently sponged with boric acid, after which the foreskin should again be slipped forward. If the foreskin is unusually long, or has a small opening, or is adherent to the head of the penis so that retraction is difficult, it is wise to wait until the trouble is corrected by the physician.

It sometimes happens that the foreskin slips back fairly easily but after the washing does not come forward readily. In a short time the foreskin becomes congested and edematous, and the more swollen it becomes the harder it becomes to replace it. If this accident happens, the following method will generally right matters: The first and second figures of the right hand are placed behind the swollen foreskin, while the ball of the thumb presses upon the head of the penis. Gentle, steady pressure is exerted by the thumb, the effort being made

to push the head back through the swollen collar of foreskin. Usually in a very few minutes the foreskin slips forward, and in half an hour or so the swelling has subsided. If this method should not prove successful, the physician should be summoned, as prolonged pressure of this constricting band may cause damage.

In bathing girl babies, the labia should be held gently apart, and a piece of cotton soaked in boric acid used to cleanse the mucous membranes. Care must be taken that the washing is toward the rectum, not away from it, as it is obviously unwise to carry any possible contamination from the rectum to the vagina or urethra. Any unnatural redness of the parts or secretion from the vagina is of importance and should be brought to the notice of the physician.

The Bath Proper.—When these details have been disposed of, the scalp is washed with soap and water, rinsed and dried. If there is much dandruff, or any scaly deposit on the scalp, it should then be anointed with a little vaselin or olive oil. The face is then washed with clean water and a fresh cloth and dried. No soap is used on the face. The rest of the body is then washed with soap and water, and the infant is ready for the tub. In placing him in the tub it is well to put the fingers of the left hand in the baby's left axilla, holding firmly to the shoulder with the left thumb. The baby's head then rests against the forearm. He is grasped under the knees with the right hand and lowered into the tub. The right hand is now free, while the left continues to support the baby, and prevents him from slipping down under the water. He is quickly rinsed and removed from the tub.

Cool Sponge.—After eighteen months, vigorous babies may have the warm bath followed by a shower or a rapid sponge with water at 70° F. The baby must react well to this—that is, he must be rosy and animated. If he seems cold, and his lips and finger tips are bluish, this part of the bath must be discontinued.

Drying.—After the infant is removed from the tub, he is placed on a soft towel in the nurse's lap and is gently patted with another until dry. Great care must always be taken that all of the deep folds and creases are perfectly dry, otherwise a very annoying irritation may be set up. When the baby is satisfactorily dry, he may be lightly powdered wherever two skin surfaces come together, as about the neck, under the arms, about the buttocks and genitalia, and, in very fat babies, under the knees. For this purpose a good, unscented talcum powder, stearate of zinc or fine cornstarch should be used. The baby is then dressed, his hair brushed and he is ready for the day.

Extra Baths.—The foregoing description applies to the daily cleansing bath. In addition, it is frequently desirable to give the baby others. This is particularly true in very hot weather, when the baby is made much more comfortable by sponging him off with tepid water once or twice during the afternoon and evening. Also it is frequently necessary to give him an impromptu bath when he has had a stool which has gone unnoticed for a time, so that the fecal matter has become widely distributed. The same care must be exercised after these baths, as after the morning tubbing, to dry the skin thoroughly. For only in this way can one prevent irritation.

Care of the Nails.—The finger nails and toe nails should be frequently trimmed with scissors. The latter should always be cut straight across, leaving the corners at least as long as the rest of the edge. In this way the chance of ingrowing toenails is much lessened. The nails should be cleaned daily with a toothpick wound with a wisp of cotton.

Care of the Teeth.—It is a frequent mistake to neglect the first teeth on the ground that they are only temporary and it makes no difference if they do decay. As a result, it is not uncommon to see children of four or five years with numbers of decayed, broken and badly stained teeth. This affects the child harmfully in a number of ways. It causes him pain and

discomfort. It frequently impairs the digestion by making it impossible for him to chew his food properly. It very much increases the likelihood of his developing large, diseased tonsils, by increasing the number of bacteria in the mouth. And finally it has a harmful effect on the second dentition, the teeth frequently coming in irregularly as a result of losses in the first set. The remedy is to care for the first set as diligently as the second. As soon as the first teeth make their appearance, they should be carefully brushed twice each day with a very soft toothbrush. If the teeth are at all stained, a few drops of milk of magnesia on the brush will prove helpful. When all the teeth are through a fairly stiff brush may be used. By the time a child is four he should be taught to brush his own teeth. At this age a pinch of any of the good tooth pastes on the market may be used on the brush, and usually adds very much to the eagerness of the child to care for his teeth. He should, of course, be supervised to make sure that he is regular in his brushing and that he does not neglect his back teeth. From time to time the teeth should be carefully inspected, and at the first show of decay he should be taken to a dentist. It is in fact not a bad plan to make a periodic visit to the dentist part of the routine of the life of every child. This can be started at two years and continued every six months thereafter. Special attention should be paid to the teeth during the transition from the first to the second set. The six-year molars, which are the first of the permanent teeth to come through, very frequently develop small cavities in the center of the grinding surface. These cavities should be properly treated as soon as discovered, because they grow with great rapidity. If the teeth are irregular in arrangement, the advice of a dentist specializing in that type of work should be sought.

Airings.—Next to his food, no one factor has such an effect on the well-being of a child as the amount of sunshine and fresh air which he gets. The age at which an infant may go outdoors depends upon the season at which he is born, and the first outing should always be sanctioned by the physician, But, as a rule, healthy infants born in summer may begin their outings when a week old, while those born in the winter may frequently start at a month. At first, the time spent outdoors should be brief, but as the child becomes used to it the stay may be lengthened, until in warm weather the baby is out almost continuously, while during the cold season he is out for two or three hours on pleasant days. The child should not be taken out in extremely cold weather, or when there are high winds, or on cold, moist days. Likewise in the very hot weather it is often more pleasant indoors during the heat of the day. Delicate children born during the spring and fall, and even robust children in very bad winter weather, are often benefited by indoor airings. They are dressed as if to be taken out, placed in the carriage, covered with warm robes. The windows of the room are then opened. In this way the baby gets considerable outdoor air with a maximum of protection. It is easy in this way to accustom a baby to the cold so that he may be safely taken outdoors.

Exercise.—The newborn infant gets his exercise by crying. Soon, however, he adds to this kicking and waving of the arms. It is important that this tendency to exercise should not be checked by clothing which hinders free motion. When a child is three or four months old it is advisable to have a definite time each day when he is placed on a bed in a warm room, with diaper off, and encouraged to kick. When he begins to sit and creep, it is well to place him on a quilt on the floor so that he may have a firm surface on which to exercise. When he begins to walk, a pen with heavy canvas floor, which can be placed over a quilt, is desirable. In this way the average baby in the home gets all the exercise he needs. In hospitals and other institutions for children, however, this is unfortunately not the case. The infants are handled less, they are talked to less, and, if care is not taken, they become

apathetic, lose their appetites and go steadily down hill. It is largely for this reason that babies do not do well in institutions. They need "loving," which unfortunately cannot be administered wholesale. Such infants should get their exercise passively; they should be picked up frequently; they should be talked to; they should have their position changed frequently, and they should be given gentle massage at the time of bath, and perhaps once again during the day. With such care many of them can be saved who would otherwise die.

Training of Bladder and Rectum.—A nurse who is caring for babies should consider it a part of her task to institute and cultivate regular habits in the babies. This applies to feedings, sleep, bath, airings—everything that has to do with the daily life. She should take special pains in training the bladder and rectum. This training really starts at birth, and at first consists of simply changing the diaper whenever wet or soiled. Soon the child learns to cry when the diaper needs changing. This is the first step. By the time he is four or five months old, and can hold his head up well when the trunk is supported, he may be taught to have his movements in a chamber. This is accomplished by holding the infant upon a warmed chamber at those times at which he usually soils his diapers. For the first time or two it may be necessary to "suggest" to him what is wanted by means of a soap stick. Very soon, however, an infant of normal intelligence learns to associate the chamber with evacuation of the bowels. The trouble necessary for this training is well repaid by the subsequent ease in caring for the child. And this habit of regularity, if acquired early, is one of the surest guarantees against constipation in later life.

Training of the bladder is not so easy and is rarely successful before the tenth or twelfth month. It is best carried out by placing the child on the chamber at frequent, regular intervals, depending on how often he is accustomed to urinate. Usually one may start by putting the child on his chair every

hour. If he keeps dry for several days with this routine, the time may be increased to an hour and a quarter, and so on until he is keeping dry for two hours at a stretch. He will soon learn to make his wants known, if sometimes he cannot go the allotted time. This training is more difficult at night. It is, of course, too much to expect of a baby who is getting 8 oz. of milk at 6 P.M. and another 8 oz. at 10 P.M. to stay dry throughout the night. And it is too much to expect of the nurse, or mother, to get up every two hours to place him on a chamber. Little can be done, in consequence, until the 10 P.M. bottle is omitted—usually at about fourteen months. At that age, however, training should be begun. The baby should be picked up at ten or eleven. If the day training has been successful, when the bladder again becomes full, say at two or three in the morning, the baby will become fussy, or cry out, and can again be taken up. By the time he is three years old, he will frequently go through from ten at night until six in the morning. It is usually necessary to pick the child up when the mother or nurse goes to bed until he is about five years old, after which he will generally sleep comfortably from his bedtime until morning without voiding.

CLOTHING

The comfort of an infant depends in no small degree on the way in which he is clothed. Whole races sometimes go astray in their habits of clothing children, with consequent discomfort to the child and detriment to the race. Witness the Italian bambino, bound so tightly he cannot move hand or foot; the Chinese girl with her bandaged feet, and the English and American youngster with bare knees in the winter weather. The requirements of proper clothing are that the garments shall be loose, light, well-fitting and sufficiently warm in winter and cool in summer. In addition, it is wise to have them as simple and easy to put on as possible.

The Band.—The use of the flannel binder seems to be firmly rooted, though what good purpose it serves after the umbilicus is healed is hard to see. It is difficult to apply, it will not stay where it belongs—either slipping down so as to get wet, or slipping up so as to hinder respiration. If tight enough to give support to the abdominal muscles, it causes unnecessary pressure upward on the diaphragm and downward, increasing the possibility of inguinal hernia. In other words, it is better left off, and its place taken by a knitted band of silk and wool, with shoulder straps, and tabs to which the diaper may be pinned.



Fig. 3.—Triangular Diaper.

The Diaper.—The principal requirements of the diaper are that it shall be absorbent and soft. The regular cotton diaper materials, such as bird's-eye, are probably the best. There are many ways of applying the diaper, of which the two given here seem the best.

The Triangular Diaper with Pad.—A large diaper is folded diagonally into a triangle. Over this is laid a second smaller one, folded into an oblong. In place of this second diaper, a soft, folded paper towel may be used, and will save much disagreeable labor, as it can be thrown away when soiled. This combination is applied so that the pad covers the buttocks and genitalia, the folded edge of the larger diaper goes snugly

around the waist, while the other corner is brought up between the thighs, the whole being secured with three safety pins, one fastening the two corners to the tab on the band, the other two bringing together the edges so as to encircle the thighs.

The Square Diaper.—This arrangement is not so easy to put on and cannot be made to look so neat. It has the advantage, however, of being less constricting, and is to be recommended for boy babies. A large diaper is folded into such a square that the upper edge will a little more than half encircle the waist. The lower edge is then brought forward between the



Fig. 4.—Square Diaper.

thighs, and the corners pinned to the corners of the upper edge. Two more pins hold the edges snugly about the thighs.

Laundering the Diapers.—Wet or soiled diapers should not be kept in the nursery. There should be separate pails for them in the bathroom or other convenient place. A soiled diaper may sometimes be partially emptied into the toilet on being removed. It is then placed to soak in its pail, which contains some water, and the lid is tightly closed. Once or twice a day all of the used diapers should be thoroughly washed with soap, and rinsed in several changes of clear water. They should then be thoroughly aired and dried.

The Rubber Diaper Cover.—This cannot be criticized too strongly. It results in the baby lying in a puddle, and is a very

common cause of irritation on the buttocks. The only time it can be justified is when traveling.

The Shirt.—Over the band goes the shirt. This should be of silk and wool in winter, and of cotton in summer. It is made with long sleeves, is cut high in the neck and buttons or ties down the front. It should be large enough to fit loosely even after shrinking.

The Petticoat.—This should be made with a white flannel skirt on a loose-fitting, sleeveless waist of muslin. In young infants it should come four or five inches below the feet. Too often this garment is made snug in the waistline, where it should be full. A very convenient petticoat has buttons and buttonholes on the shoulder straps. This saves the trouble of getting the arms through the armholes.

The Dress.—Taste and pocketbook will determine the type and material of the outside dress. It reaches an inch or so below the petticoat, and should be of some light, easily washed material. The simpler it is, the cleaner it will keep and the more easily it will be laundered.

Covering the Feet.—Loose socks or knitted booties should be worn in cold weather and at other times if the feet have a tendency to become cold or blue.

Night Clothes.—The baby has a complete change of clothing on being put to bed for the night. It consists of band, diaper and shirt, as in the day, and over these the nightdress. This is made of any of a number of materials and is long and loose. In very cold weather heavier material may be used, while in summer a very light weight is desirable.

Clothing in Summer.—It is my experience that very few infants are underclothed, while in hot weather most are very much overclothed. During the hot, humid days of summer babies suffer extremely, and are particularly liable to digestive upsets. In order to make them as comfortable as possible, they should be very lightly clothed. First the petticoat should be discarded, then the shirt, while in exceptionally hot weather the diaper and band are none too little.



CHAPTER III THE PREMATURE BABY



CHAPTER III

THE PREMATURE BABY

THERE is no type of case in which good nursing is as essential as in the care of the premature infant. Without an intelligent and coöperating nurse, the physician's best efforts are largely wasted. In fact the outlook in these cases depends very materially on how soon after birth the infant is placed in the hands of such a nurse.

The group which we speak of as "premature babies" has no sharp limits. It comprises, roughly, babies who at birth weigh under 5 lb. (2,300 gm.), who measure under 19 in. (47 cm.) or who are unusually feeble from some other cause. Most of them, of course, are born before term. Their appearance is quite characteristic. The skin has a peculiar waxy transparency. The muscles are very weak so that the child lies relaxed and practically motionless. The breathing is shallow and irregular, and the cry but a feeble whine. The smaller ones are quite unable to nurse satisfactorily, and some are even too weak to swallow well. These infants chill easily and, unless artificial heat is applied, their temperature falls below normal. Furthermore, they have but little resistance to disease, and even minor infections frequently prove fatal. In consequence there are three main problems in their care: to nourish them successfully, to maintain a normal temperature and to avoid infection.

Nutrition.—Breast milk is the only satisfactory substance on which to feed the premature. This complicates matters, as the mothers of infants born much before term seldom have an adequate supply. In consequence it is usually necessary to obtain milk from a wet-nurse. Furthermore these patients

are seldom strong enough to nurse from the breast, and so some easier way for them to get the milk must be found. Having obtained milk from the mother or nurse (see chapter on Maternal Nursing for methods of obtaining milk), the best way to give it is usually with the Boston Feeder. This is a graduated glass tube holding I or 2 oz., having a small nipple attached to one end and a rubber bulb at the other. The milk at the proper temperature is placed in the tube, the nipple is given to the infant, and his feeble efforts at sucking are augmented by gentle pressure on the bulb. Some infants are too weak even to be fed in this way, and must get their food by gavage. This is accomplished by passing a small rubber tube through the mouth into the stomach, and slowly pouring the required amount of warmed milk into it. As the strength of the baby increases, the Boston Feeder is substituted for gavage, and later the ordinary nursing bottle or the breast takes the place of the Boston Feeder.

Feedings should be given regularly every three or four hours. At first only very small amounts should be given—perhaps ½ oz. (15 c.c.) at a feeding, this quantity being gradually increased until a sufficient amount is given so that the child may gain. Thus a baby weighing 3 lb. will need from 1½ to 1½ oz. (35 to 45 c.c.) of breast milk every four hours, while a 5-lb. infant will need 2 oz. (60 c.c.) every four hours.

Maintenance of Body Temperature.—In order to keep the premature baby's temperature within normal limits considerable ingenuity and great watchfulness are necessary. In some cases, a special apparatus called an "incubator," is used for the purpose, but it is costly, gets out of order easily, and requires special care to operate, so that it has been largely discarded for simpler means. Many hospitals which care for prematures have special "warm rooms" where these delicate infants are kept. These rooms are arranged so that the temperature may be kept constant at from 85° to 90°, and so that the air may be kept fresh. The clothing also is designed

for warmth. A particularly good type of premature jacket is made of absorbent cotton, covered with gauze and quilted. It has a hood for the head, opens down the front and is long enough to cover the baby entirely. This permits of examining or changing the baby with a minimum of exposure. The usual



Fig. 5.—Jacket for Premature Infant.

diaper may be used, or, in its place, a pad of cotton may be placed under the buttocks and about the genitalia. These should be changed when wet or soiled, exactly as with normal infants. A soft, warm blanket, in which the infant, clothed in his jacket, may be wrapped, completes the wardrobe.

In the home, where no "warm room" is available, the procedure is somewhat different. A small crib, or clothes basket,

is provided with heavily padded sides. In this is placed the mattress or a fairly hard pillow. The baby is anointed with olive oil and covered, except for the face and buttocks, with sheets of absorbent cotton which are changed every other day.

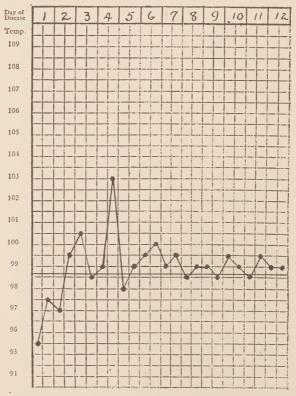


Fig. 6.—Temperature Chart of Premature Infant. Patient showed a low temperature on admission, with wide variations for first 4 days, after which temperature remained within normal limits.

A separate pad of cotton which can be changed as necessary is placed over the buttocks and the child is wrapped in a soft blanket. He is then placed in the basket and several hot-water bags are laid around the edges of the mattress or are hung from the upper edges of the basket. Over the basket and

covering all but about a fourth of it is placed a blanket, to protect the infant from drafts and light. Great care must be taken that the hot-water bags do not come in contact with the infant, as serious burns may result. Electric pads are sometimes used in place of hot-water bottles. These, however, occasionally get out of order, and so must be watched with especial care. The room in which the basket is kept should have a constant temperature of 75°. Whether the warm room or the heated basket is used, the nurse should take the temperature of the child at regular intervals. The aim should be to keep this temperature between 98° and 100°. This is difficult to do, and wide variations are sometimes seen until things get to running smoothly. If the water bottles are allowed to get cool, the patient's temperature may fall to 95° or even lower, while, if they are too hot, or placed too close to him, they may run the temperature up over 105°. As the child will not do well if his temperature fluctuates in this way, great care is necessary to keep it within normal limits.

Prevention of Infection.—The premature infant has very little resistance to disease and must be shielded from all possible sources of infection. If more than one infant is in a room, screens or glass partitions should be used between the cribs. All who enter the room should slip a gown over the street clothes and if suffering from even the slightest cold should wear a gauze mask over the mouth and nose. In the home it requires firmness and tact on the part of the nurse to protect the child, as there are always grandparents and other fond relatives who insist that they just must hold the baby and kiss him. One cannot refuse them a glimpse of the infant, but one must require that a handkerchief be held over the face, that the child be not touched, and that the visit be brief.

Routine Care.—The secret of caring for these delicate infants lies in doing the things which are required as quickly and with as little disturbance to the patient as possible. For

proper cleanliness it is necessary to change the diaper or pad when soiled or wet. The bath is dispensed with, but the child is gently rubbed off with olive oil every second day when the coverings are changed. The feedings, unless from the breast, are given without removing the infant from his bed. The position of the child can be changed at each feeding time. The temperature at first should be taken every four hours, but, as soon as it is satisfactorily regulated, every eight hours is enough. Beyond this, the less the patient is handled, the better he will do.

Prognosis.—Without special care and careful feeding with breast milk, most of these babies die. If they fall into experienced hands at birth, their chances of living are good if they weigh over four pounds. At three pounds, there is a fair chance of success; below that the outlook is not good, but still some do live and thrive, and one should never give up hope of ultimate success.

The progress of these infants, at best, is never rapid. For a long time their weight may remain stationary, then there is a gradual gain—perhaps an ounce or two a week. Slowly they gain momentum and eventually grow at the same rate as other babies. By two years, many of them have caught up to their more fortunate fellows, and go through life on an equal footing with them.

Rickets in the Premature Baby.—For some reason, premature infants are particularly apt to develop rickets. Consequently, measures to prevent this disease should be begun at the earliest possible moment. Usually by the time the infant is three months old one may start cod-liver oil, giving two or three drops after each feeding. If the digestion will permit, this amount is slowly increased up to fifteen drops three times a day. The careful use of ultraviolet rays is also recommended for the prevention of rickets in these cases.

CHAPTER IV GENERAL CONSIDERATIONS OF FEEDING



CHAPTER IV

GENERAL CONSIDERATIONS OF FEEDING

Importance.—Infant feeding is the most important part of pediatrics. When we consider that over half of the deaths of babies during the first year are due more or less directly to. nutritional disturbances, we see what a factor proper feeding can be made in reducing infant mortality. It is a subject about which every mother and every nurse must know something, and the more they know the better. Unfortunately one cannot feed babies by rule. There can be no standardized method of feeding, because there are no standardized babies. the last analysis, beyond all knowledge of the principles of nutrition, infant feeding is an art. In consequence, every infant from the time of his birth should have his feedings supervised by a physician skilled in that art. What follows, then, is to be taken in the light of underlying principles and procedures, which—while they may be true for babies as a whole should not be considered as applying to any particular baby.

Food Elements.—Any diet to be satisfactory must contain certain food elements: proteins, fats, carbohydrates, salts and water. Each of these has its own part to play in the activity and growth of the child.

Proteins are necessary to replace tissue waste, and also for growth. The curd from the milk and the white of egg are examples of food proteins. Slightly different proteins are found in the milk of different animals. The most digestible, from the infant's standpoint, is that from mother's milk. When proteins are insufficient in the diet, there is anemia and slow growth. Infants fed on condensed milk, which is low in protein but high in carbohydrate, occasionally get very

fat. This is not desirable, however, as they are soft and flabby, and are particularly susceptible to disease. When an excess of protein is given, there are large, grayish, crumbly stools, constipation and stationary weight. For this reason food containing a high amount of protein is given in certain types of diarrhea.

Fats are used by the body to produce heat and energy. They are readily stored up in the subcutaneous layers. This is particularly true in healthy infants who are generously padded with rolls of firm fat. Fats stay in the stomach longer than other foods and so are apt to cause vomiting. When much fat is taken it may appear in the stools as "soap curds."

Carbohydrates are of two sorts: the sugars which are soluble in water, and the starches, which are insoluble. The sugars are of various kinds: lactose, or milk sugar, which is found both in mother's milk and cow's milk; cane sugar; and maltose and dextrin, which two usually are found together under the head of dextrimaltose. These sugars are easily absorbed and cause a rapid gain in weight. In excess, however, they are apt to cause flatulence and diarrhea. The starches which the child gets in the form of cereal gruels are more slowly digested. They are not well taken care of by the infant until three months of age, and usually are not added to the diet before that time. They do not occur in mother's milk.

Salts are necessary for growth, particularly of the bones. In normal diets they are present in large enough quantities to supply the demands of the body, and no special notice of them need be taken in preparing the infant's food.

Water is one substance which is absolutely essential to life. An infant can go several days without food, with no serious consequences, but, if deprived of fluids, even for a few hours, alarming symptoms develop. A normal infant needs about one fifth of his body weight in fluids in each twenty-four hours. Thus a 5-lb. baby needs I lb. of fluid or I pt. (A baby of 2,500 gm. needs 500 c.c. of fluid.)

In addition to these substances which can be weighed and measured, there are other important elements in the diet, about which our knowledge is unfortunately far from complete. These factors are spoken of as "vitamins." Of these the most important are the antiscorbutic, which is found in orange juice and many other fresh foods, and which prevents the development of scurvy, and the antirachitic, found in mother's milk and cow's milk to some extent, and to a high degree in cod-liver oil, which protects the child from rickets.

Furthermore, there are substances in mother's milk which protect the nursing child from certain contagious diseases. The child acquires with the milk immunity to diseases to which the mother is immune. Thus, if the mother has had measles, the child on the breast will not contract the disease, even if exposed. This, of course, is a strong argument in favor of breast feeding.

Food Requirements.—The adult needs food to keep up his body heat and to supply energy for his various activities; he needs nothing for growth. An infant needs much more food in proportion to his weight than an adult, because he must grow and because loss of heat is in proportion to body surface, not to bulk, and an infant has more surface in proportion to his weight than an adult. In order to know how much food an individual is getting, we are accustomed to figure the caloric value of his diet. We know, for example, that I gm. of protein furnishes 4 calories, and I gm. of carbohydrate the same, while an equal amount of fat produces 9 calories. Knowing the composition of any food, we can then tell how many calories a given amount of it contains. Thus we know that I oz. of cow's milk furnishes 20 calories. When we figure out the caloric value of the food taken by infants and children who are in good health and are gaining well, certain very definite facts become evident. The normal infant at birth requires in the neighborhood of 50 calories a day for each pound of his body weight (110 calories per kilogram). As he grows, this figure gradually becomes less, so that a year-old baby will do well on about 35 calories for each pound (80 calories per kilogram).

Interval Between Feedings.—Regular habits of nursing should be insisted upon from the first. When the doctor has decided at what times he wishes the patient fed, nothing should be allowed to interfere with the schedule. If asleep at feeding time, the baby should be awakened. For the night feedings, if there is fear of the mother or nurse sleeping through, an alarm clock should be used. After a short time this precaution will not be necessary—the baby will be the alarm.

Formerly, babies were fed every time they cried. The fact that humanity survived speaks volumes for the hardihood of the race. A baby is as apt to cry because his stomach is too full as because it is empty, and to give more milk to an infant with a full stomach is to bring on an attack of colic, or worse. Gradually experience and some experimental work have shown that long feeding intervals are better for the baby and easier for the mother. The four-hour interval is perhaps the most satisfactory. The baby is fed at six, ten, two, six, ten, two, six feedings in the twenty-four hours. By the end of the second month, the 2 A.M. feeding may usually be omitted, so that the baby and mother sleep through from 10 P.M. to 6 A.M. The 10 P.M. feeding can usually be dropped by fourteen months, while at eighteen months the child does well on three meals a day.

Sometimes it is felt wise to feed somewhat more frequently, when a three-hour schedule is adopted during the day, with four hours between the night feedings, thus: six-nine-twelve-three-six-ten-two. This gives seven feedings in the twenty-four hours.

Methods of Feeding.—There are three methods of infant feeding: mother's milk, mixed feedings and artificial feedings. Which of these methods will be used depends upon the amount of breast milk available and upon the age of the child.

CHAPTER V MATERNAL NURSING



CHAPTER V

MATERNAL NURSING

ONE does not have to be around infants long to recognize the immense difference between those fed on the breast and those who are artificially fed. No formula has ever been devised which proved half as satisfactory for feeding babies as mother's milk. Fortunately most mothers can nurse their babies, and many with a very inadequate flow of milk can be helped and encouraged to the point where they can supply their infants adequately. It is a mother's duty to nurse her child, and on no consideration should she evade this duty, except on the advice of a physician. A sympathetic nurse can do much to persuade a doubtful mother that she should suckle her own infant.

In this day and age with its diversified interests, many mothers fail as nurses, simply because they do not lead a sensible sort of life.

Food.—The diet of the nursing mother should be plain, wholesome and abundant. Foods which agree with the mother are not apt to make the child ill through her milk. As she is eating for two instead of one, she will need more food than formerly. It is, however, a mistake to cram a mother with food which she does not want in order to increase her milk supply. Many a mother has been made ill in this way. If it is desired to increase the flow of milk, it can best be done by giving liquids, such as cream soups, cocoa, cereal gruels and milk. Most mothers can take a quart of milk a day without discomfort, and it is the best stimulant for the breasts which we have at our disposal. Drugs are useless in increasing the supply of milk.

Sleep and Rest.—Practically all nursing mothers find that they need more sleep than formerly. They are almost always disturbed at least once during the night, and must make up this loss. At least eight hours sleep at night with a nap or a long rest in the middle of the day is essential. Some mothers who are habitually tired from their many duties profit by lying down to nurse the baby during the day, instead of sitting up. This simple expedient insures at least an hour's extra rest.

Care of the Bowels.—Young mothers almost always suffer from constipation. They should be careful that the bowels move well at least once a day. To this end, aromatic fluid extract of cascara, compound licorice powder and various other laxative preparations are useful. Recourse must occasionally be had to an enema. The saline cathartics should be avoided, as they sometimes upset the infant.

Exercise and Recreation.—Exercise, particularly out-of-doors, should be commenced as soon as the mother is strong enough. Only the milder forms which can be undertaken without fatigue should be practiced. A two hours' walk in the park or open country or a few holes of golf are excellent. She should also have a certain amount of recreation which will get her mind off of the baby for a time, such as an occasional visit to the theater. On the other hand, many women fail as nurses because soon after the baby arrives they attempt to go back to the whirl of debutante days. This soon ends in a diminished milk supply and an upset baby. In other words, the first consideration of the nursing mother must be not her own pleasure but the well-being of her baby, and her life must be ordered accordingly.

Mental State of Mother.—The mental and emotional state of the mother has a profound effect on the baby. Violent emotion, such as anger or a severe fright, often causes a complete cessation of the milk for many hours. Worry and anxiety frequently cause a diminished supply. If the mother is happy and contented, she is apt to have a good baby. If she is irritable and depressed, her baby is more than likely to make matters worse by being cross and colicky. It is probable that unpleasant emotions liberate substances which pass over in the milk and act as poisons to the baby.

Acute Illness.—Minor ailments, such as colds, tonsillitis, gastric upsets and the like, while they may cause a lessened supply of milk for a few days are not indications to wean the baby.

Menstruation.—Many mothers have a return of their menstrual periods while still nursing. This usually causes a slight upset on the part of the baby for a few days. Vomiting, and a few loose, green stools, are not unusual. A certain amount of fretfulness is also the rule. These disturbances usually clear up in about three days, however, after which nursing goes on normally.

Care of the Breasts.—The nipples should be carefully washed before and after nursing with a saturated solution of boric acid. This should be applied with fresh cotton pledgets. If the nipples become cracked or sore, they may be treated with zinc oxide ointment or tincture of benzoin, 5 per cent in liquid petroleum. In either case it is well to use a nipple shield until the nipple has had a chance to heal. A cracked nipple is always a source of danger as it gives a portal of entry to bacteria, which may set up a breast abscess. In consequence, such a nipple should always be protected with a sterile gauze pad between nursings.

Technic of Nursing.—Generally only one breast should be used at a feeding, alternate breasts being given at successive feedings. As a rule, a mother who has not enough milk in one breast when so given will not have enough in both breasts, if both are given at each feeding. The mother may nurse either sitting or lying down. In either case, the baby is supported on the arm corresponding to the breast to be given, while the breast tissue is held away from the baby's nose with

the fingers of the other hand. The first milk which comes flows freely and in the first five minutes the baby receives at least 75 per cent of his food. The milk which comes later is richer in fat and comes more slowly. At the end of fifteen minutes the baby has received practically all that he is going to get, and to allow him to nurse longer than twenty minutes is simply tiring both mother and infant. At the end of each nursing, the baby should be held over the shoulder and gently patted on the back for a few minutes before being laid down. This allows any air which has been swallowed with the food to come up, and frequently prevents colic and vomiting.

Indications of Insufficient Breast Milk.—The breast-fed baby should show an average gain of at least 4 oz. (110 gm.) a week. When he fails to show such a gain, one should always question the quantity of food the baby is receiving a day. This can be readily determined by weighing the baby before and after each feeding. The difference in weight represents the amount of food which the baby has received. In making these weighings, it is not necessary to undress the baby and no calculation is necessary for the clothes.

The baby who is not getting enough food is often entirely contented; on the other hand, he frequently does his best to make his troubles known. He is not ready to stop nursing even after he has been at the breast for a long time, and when taken from the breast he cries and fusses for some time. An hour or two after nursing he begins to cry again, and cannot be comforted until his next feeding time. If kept at an emptied breast, he may gag, choke and often even vomit. He is apt to be constipated, but, when the amount of food falls quite low, he may have frequent small stools which resemble meconium. They are dark, greenish black and of a shiny appearance.

The treatment of these conditions is either to increase the supply of breast milk, or make up the deficiency with some other food, or both.

Indications of Excessive Breast Milk Feedings.-Most babies who take too much breast milk promptly regurgitate the surplus. Some, however, will retain amounts far in excess of their needs. This is particularly true of babies who are fed at frequent intervals. Such babies usually go to sleep immediately after nursing, only to awake screaming in fifteen or twenty minutes. They clench their fists and draw up their legs as though in pain, and usually are not comfortable until they have eructated or passed flatus in considerable amounts. This condition, commonly called colic, is practically unknown except in overfed infants. Babies who are getting too much frequently alternate between constipation and diarrhea, and almost invariably vomit as well. The stools are apt to show large, whitish curds, which are due to an excess of fat. These overfed infants are also particularly susceptible to skin eruptions, especially to eczema of the face and scalp.

The diagnosis is again made by weighing the baby before and after nursing. Treatment consists in lengthening the interval between nursings, or shortening the time of nursing, or both. It is not uncommon to see babies gaining rapidly on breast feedings of only five minutes every four hours. Increasing the amount of outdoor exercise which the mother gets frequently helps when the milk is too rich in fats.

WET-NURSING

It sometimes happens that an infant for whom the mother has insufficient breast milk does badly on a formula. Frequently the only salvation for such infants lies in milk from another nursing mother. Unfortunately, breast milk is difficult to obtain even in large cities. Some hospitals maintain a regular staff of wet nurses recruited from patients in the maternity clinic, or from homes for unmarried mothers, such as the Florence Crittenton Missions. It would be splendid if every city could have a Breast Milk Exchange where mothers with an

excess could take their milk, and from which it could be distributed to delicate infants. But the difficulties in the way of such enterprises have made them fail in almost every instance.

Selection of Wet-nurse.—In an emergency, milk from almost any nursing mother is better than none. However, if



Fig. 7.—Massage of Breast. This wet nurse frequently gave a quart of milk a day. She is properly gowned and is holding breast and bottle correctly.

there is a choice the nurse should be between eighteen and thirty-six years of age, of placid disposition and cleanly habits. She should, of course, be free from syphilis and active tuberculosis and, if she is to come in contact with the patient, she should also be free from gonorrhea. Her own infant is the best guide to the quality of her milk. If he is robust, her milk is in all probability satisfactory. It is not necessary that her baby be of the same age as the patient, provided

he is over three weeks and under a year of age. Before the third week the milk has not yet reached a constant composition and still shows some of the characteristics of colostrum, while, after a year, the milk is usually of poor quality.

Method of Obtaining Milk.—It is usually better to feed the breast milk from a bottle than to have the wet-nurse suckle the patient. In this way one knows exactly how much the infant receives without the inconvenience of weighing him before and after nursing, and the chance of any infection from the nurse is rendered very much less. The milk may be drawn with a breast-pump, or better, it may be expressed by hand. The hands of the nurse are thoroughly cleansed with soap and water, and the nipple and breast with boric acid. A sterile graduate or a bottle and funnel is held below the nipple with one hand. With the thumb and forefinger of the other hand the breast is grasped about an inch from the nipple, and firm, rhythmical pressure made with the thumb. This procedure forces the milk from the breast into the graduate or bottle. It can then be kept on ice until used, or, if wanted at once, it can be reheated to body temperature and fed.

Care of Wet-nurse's Baby.—If the nurse has sufficient milk for both infants there is no difficulty. At each feeding time her own infant nurses on one breast after the other has been expressed for the patient. If she has not enough for both, it becomes necessary to put her baby on mixed feedings, giving both breast and formula.

As the success of a wet-nurse depends largely on her being free from anxiety, it is necessary that everything be done to keep her baby in excellent condition, and to this end the feeding of her baby should receive the same careful attention from the doctor and nurse as is expended on the feeding of the patient.

The Wet-nurse in the Home.—Great tact is usually necessary in handling a wet-nurse in a private home, and one must be governed largely by her former status in society in deciding whether she shall eat with the servants or shall occupy a place midway between them and the family. Besides caring for her own infant and supplying milk for the patient, she should have duties enough about the house assigned to her to keep her occupied for part of her day. She should, also, be encouraged to spend several hours a day out-of-doors. Her food should be plain but nourishing, and she should have at least a quart of

milk a day to drink. Her remuneration will depend entirely on circumstances, but should be definitely settled in advance. Where available, colored wet nurses will usually be found easier to get along with than white ones. Their milk is equally good and usually more abundant.

WEANING

Most of the dread with which mothers look forward to the process of weaning from the breast is unfounded. If the baby is weaned gradually, and to a satisfactory diet, no difficulty is experienced, either by the baby or the mother, except in the occasional case. On the other hand, it is a step which should never be taken lightly.

Indications for Weaning.—It is not wise for a mother to nurse her baby longer than one year. If nursing is continued beyond that time, the milk becomes poor in quality and the baby gains slowly and becomes pale and flabby. So it is well to begin weaning the baby before the end of the first year. If the mother should lose her milk before that time, it is of course necessary to wean. Certain diseases also make it imperative that a mother wean her baby. Active tuberculosis is an indication, both for the sake of the mother and the child. Eclampsia is an indication, as in that disease the milk is a poison to the baby. Diabetes and the severer grades of nephritis are grounds for weaning, as are acute infections such as typhoid fever and pneumonia. In the latter it sometimes happens that after recovery the mother can again nurse the baby successfully. A two-months-old patient of mine was put upon the bottle because the mother had influenza and pneumonia. After an illness of three weeks, the mother again put the infant to the breast at regular intervals; gradually her milk came back and she nursed the baby successfully through the ninth month.

Pregnancy is an indication to wean the baby. But, if the nursling is doing well, the weaning may be carried out so

slowly as to run no risk of upsetting either mother or child.

Method of Weaning.—Just how the baby should be weaned depends of course on why it is necessary to take the step, but, in general, weaning should be carried out slowly. For example: A mother with abundant milk, who has nursed her baby for nine months, may begin by replacing the 2 P.M. feeding with a bottle; after two weeks, she may nurse at 6 A.M., 2 P.M. and 10 P.M., giving bottles at 10 A.M. and 6 P.M. After another two weeks, the 2 P.M. nursing may also be replaced by a bottle. Then the 6 A.M. feeding is replaced, and finally the 10 P.M. Done in this way, the baby is rarely upset, and the mother has little inconvenience from overfilled breasts. This is weaning under ideal conditions, but often it is necessary to change to the bottle abruptly. The important thing to remember in that case is to put the child on a formula which is far below his calculated needs in strength, and somewhat below in amount, increasing to his normal strength gradually as he shows he can handle the stronger food. It is far better to have an infant lose a little from temporary underfeeding than to have him become upset and lose a great deal. The importance of beginning with a weak formula when weaning cannot be emphasized too strongly.

The Breasts During Weaning.—It very frequently happens that weaning is more upsetting to the mother than to the child. The breasts become very full and painful. It is usually a mistake to resort to the breast-pump, as this simply postpones the day when the body strikes a balance between supply and demand. The filling of the breasts can be lessened by decreasing the fluids taken by the mother, and by administering saline cathartics, which will still further reduce the fluids in the body. A tight binder supporting the breasts and ice-caps applied to them are also of assistance. Rarely it is necessary to employ drugs to lessen the pain; of these, aspirin and codein are perhaps the most valuable.

MIXED BREAST AND ARTIFICIAL FEEDINGS

Mixed feeding is a compromise between maternal and artificial feeding. Many mothers who have not enough milk to supply their infants completely still have enough to give a little at each feeding, or to give two or three complete feedings a day, the other feedings being supplied by formula. Weaning, as we have seen, is best accomplished by resorting temporarily to mixed feedings. There are two methods of employing mixed feedings: complementary and supplementary feeding.

Complementary Feeding.—This consists in giving breast and bottle, both, at each feeding. The baby is allowed to nurse perhaps ten minutes on the breast, and is then promptly given the bottle. Care must be taken that the formula given is not too sweet, for in that case the infant will often refuse the breast in expectation of receiving the bottle which he prefers. For this reason milk sugar is sometimes to be preferred to cane sugar during mixed feedings. This method has the advantage over the following, that it stimulates the breast at each feeding, thus tending to increase the supply.

Supplementary Feeding.—This is the plan outlined in the section on Weaning. It consists in substituting a bottle for an entire breast feeding. It is particularly useful when it is desired to decrease the supply of breast milk.

Solid Foods in Mixed Feedings.—A great majority of mothers who nurse their infants for six months or longer slip automatically into a variety of mixed feeding. They give the baby cereal, or a crust of bread, or a cracker from time to time as he seems hungry. In welfare work among the more ignorant mothers it is a good practice to suggest well-cooked cereals and broths at the earliest possible date, knowing that if these are not given the chances are the child will be offered cakes and tea or coffee. Even in cases where one has complete supervision of the feedings, it is frequently desirable to give farina at one or two breast feedings as early as the seventh month.

CHAPTER VI ARTIFICIAL FEEDINGS



CHAPTER VI

ARTIFICIAL FEEDINGS

THERE are almost as many methods of artificial feeding as there are pediatricians. And each man, knowing his own system thoroughly, gets better results with it than he does with other methods. But all methods fall short of the ideal, for no one has yet devised a formula which is as satisfactory a food for infants as mother's milk. In this chapter these different plans of feeding cannot even be touched upon; all that can be done is to outline the preparation and administration of the foods most used in infant feeding.

If one cannot have mother's milk for the infant, and cannot procure breast milk from a wet-nurse, then by far the best substitute is cow's milk properly modified. By modification is meant the changing of the milk by dilution and addition of various substances so that it can be better digested and will better nourish the infant. Modification is necessary because whole cow's milk is not well handled by the infant's digestive organs.

Relative Composition of Woman's Milk and Cow's Milk.—Both of these milks contain all of the elements necessary for the baby, but in different proportions, as is shown in the following table:

RELATIVE COMPOSITION OF WOMAN'S MILK AND COW'S MILK

Food Element	Woman's Milk Per Cent	
Fat Carbohydrate Protein Salt	7.5 1.25	4 4.5 3.5 0.75

A study of this table shows that cow's milk is richer in every ingredient except sugar. In consequence, the first step in practically all modifications is to dilute the milk and add sugar. Unfortunately there are chemical differences which are not shown in the table. The protein of cow's milk, in addition to being greater in quantity, is different in nature and has the disadvantage of forming large, hard curds in the stomach, where mother's milk forms soft, flaky curds. This can be partially remedied by boiling and by various additions to the milk, to be discussed later.

Choice of Cow's Milk.—Milk for babies should be the best obtainable. It should be clean, fresh and from healthy animals. It should contain no preservative or adulterant. To obtain these ends, it is necessary that the cows be well-kept, frequently brushed and washed, that they should be tested with tuberculin, and be discarded if suffering from tuberculosis or other communicable disease. All utensils used for milk should be kept scrupulously clean and frequently scalded. All persons coming in contact with the milk should be healthy, and should exercise unusual care as to cleanliness. The dairy should have facilities for cooling the milk rapidly and keeping it cool. It should be delivered within thirty-six hours after milking.

Milk from mixed herds is preferable. Milk from a single cow is not to be recommended as it varies too much from day to day, and as the supply is not dependable.

Frozen Milk.—It sometimes happens that the milk delivered in winter is received partially frozen. Such milk when melted will frequently show yellow fat droplets floating upon the top. These should be removed before preparing the formula. Frozen milk seems to be more difficult to digest, and sometimes causes slight intestinal disturbances in delicate infants. Boiling the milk lessens its bad effects.

Sterilization of Milk.—Unless one is absolutely certain as to the purity and cleanliness of the milk supply, it is far safer to boil it. This should always be insisted upon in welfare work,

where only the cheaper grades of milk are available. Even with good grades of pasteurized milk there are certain advantages to boiling which outweigh the objections. The only grave objection to boiling is that it destroys the vitamin which protects the child from scurvy. This difficulty can be remedied by giving the child each day about I oz. (30 c.c.) of orange juice or tomato juice in an equal amount of water. This precaution should never be omitted when using boiled milk.

Choice of Formula.—While the infant's feedings should be prescribed by the physician, it is difficult to discuss the preparation of feedings without first giving a general idea of the approximate formulas for infants of different ages. These are at best only suggestive and should not be interpreted as applying to any individual infant.

In practice one does not as a rule figure the formula as closely as is done in this table. It is usually wise to make some allowance for spillage or other accident. In hospitals, where numbers of formulas are to be made up, it is customary to have some simplified method of expressing the proportions that are to go into the mixture. A very convenient system, for example, which is used in some hospitals, is to express all feedings in terms of 20-oz. mixture. A baby who is to receive five feedings of 6 oz. each, 18 oz. of milk, 1½ oz. of sugar, made up to 30 oz. of water, would have his formula written 30 oz. of a 12 in 20 mixture with 1 oz. of sugar added, given in five feedings. In this way all 12 in 20 mixtures may be made up together and much time and material saved.

Equipment Necessary for Milk Modification.—In an emergency all that is needed to prepare the baby's milk is a nursing bottle and a sauce-pan. But where there are bottles to be prepared each day the work is made far easier by having certain utensils adapted to the purpose. The following list may be varied to suit the conditions:

Two quart double-boiler Measuring glass graduated in ounces

In Pounds and Ounces TABLE OF FORMULAS

Total Additional Foods	Orange Juice		Broth Green vegetables added to broth
Total Volume	18 21 24	35	4 4 4 4 5 0 0 0
Diluent	Water "	Cereal water	33 33 33
Ounces of Sugar	ннн	1117	1 1 0
Ounces of Milk	8 IO I2	11 18 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	30 ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °
Ounces per Feeding	3,1/2	w0 K0	∞ ∞ ∞
Weight Number Ounces in of per Pounds Feedings Feeding	9	տտտւ	nmm m
Weight in Pounds	7 8 4,6	10/2	16 18 20 20
Age	Birth	3 months	

In Metric System

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Funnel for filling bottle Nursing bottles Wire rack for bottles Bottle brush Scales to weigh carbohydrates

The bottles may be had in various sizes but should be of a type with a gradual taper toward a large neck so that they may be easily cleaned. Or the cylindrical Hygiea bottles may be used. The bottles should be thoroughly cleaned and boiled before filling. After using they should be rinsed out with cold water.

The nipples should be thoroughly cleaned and boiled when purchased. After using, they should be scrubbed inside and out with soap and water, boiled and kept in a sterile glass jar until used. The hole in the nipple should be such that when the bottle is inverted the contents will just drip through. If the hole is too small, it may be enlarged with a red-hot needle; if too large the nipple may be put away and used later when the baby is taking a thicker type of food. If a nipple has softened to the point where it collapses too readily, its usefulness may be somewhat prolonged by stretching a boiled, cotton thread across the neck of the bottle and applying the nipple over this.

If scales are not available on which to weigh the sugar, one may have the given amount weighed at the druggist's, and note its volume in the measuring glass. It will be found that the table on page 65 roughly represents the volume of the more commonly used sugars and cereals.

These equivalents are convenient in welfare work where proper facilities for the preparation of formulas are not available, but, where possible, formulas should be accurately weighed and measured.

Preparation of Formulas.—In the home it is usually found most convenient to prepare the bottles for the day between the first and the second morning feedings, starting in time so that they may be finished before time for the baby's bath. The re-

VOLUME OF SUGARS AND CEREALS

Weight in Ounces

Food	Weight in Ounces	Volume in Level Tablespoonfuls
Cane sugar Lactose Dextrimaltose Farina Barley flour Oatmeal	I	2 3 4 2 ¹ / ₂ 2 ¹ / ₂ 4

Weight in Grams

Food	Weight in Grams	Volume in Level Tablespoonfuls
Cane sugar	14	I
Lactose	9	I
Dextrimaltose	7	I
Farina	12	I
Barley flour	12	I
Oatmeal	7	I

quired amount of milk is poured into the measuring glass, to this is added the sugar, the volume being then made up to the given total with the diluent, either cereal water or plain, boiled water. These ingredients are thoroughly mixed, poured into the double-boiler and allowed to boil for five minutes. In the meantime the bottles and funnel are boiling in another pan. When the milk is ready, the bottles are placed in the rack and the amount to be used at each feeding is poured into each bottle by means of a funnel. The bottles are then stoppered with sterile, absorbent cotton. The rack containing the bottles is then placed in a pan of hot water (the water in which the bottles were boiled will serve). This pan is then placed so that cold water will run into it, slowly at first, and then rapidly. When the milk is reasonably cool, the bottles—still in the rack—are placed on the ice, where they are kept until ready to use.

In hospitals, where there is the proper machinery for pasteurizing formulas, the routine is somewhat different. After mixing the formula, the required amount is placed in each bottle, the bottles are stoppered and placed in the pasteurizer,



Fig. 8.—Bottle Feeding. The baby is held in a comfortable position and the bottle tilted so as to keep the nipple filled with milk.

where they are kept at 140° for fifteen minutes. The bottles are then rapidly cooled and kept on ice.

When feeding time comes, one bottle is removed from the ice and the milk brought to body temperature. This may be done by placing the bottle in a small saucepan of water and heating on the stove or alcohol lamp. Rather more convenient, however, is the electrical bottle-heater which is on the market. This may be kept in the nursery, and heats the bottle in a few moments. When heated. the stopper is removed, the nipple applied and the feeding is ready to be

given. In placing the nipple on the bottle, the hands must be scrupulously clean, and only the lower part of the nipple which surrounds the neck of the bottle should be touched.

Method of Giving Bottle.—The child may be fed either lying in his crib or in the nurse's arms. In either event the bottle should always be held by the nurse—never left propped up in the crib. It should be so held that the neck of the bottle is con-

stantly filled with milk; this lessens the chance of the child swallowing air with his food. If the baby is inclined to gulp down his food too rapidly, he should be given a rest from time to time by taking the nipple from his mouth. On the other hand, if the child nurses indifferently, it is not wise to let him have the bottle for more than twenty minutes. When a bottle is emptied, it should be promptly taken away from the child, so that he may not suck air through the nipple. Any part of a feeding which is left by the child should be thrown out, first noting how much has been taken.

FOODS USED FOR INFANTS

Barley Water.—When the infant is three or four months old, it is customary to use barley water as a diluent for the milk, instead of plain, boiled water. As has already been pointed out, starches as a rule are not digested well before this time. The advantages of cereal water in the formula are several. The milk forms smaller curds than when plain water is used, the caloric value of the mixture is slightly increased, the child is apt to be better satisfied and to remain contented longer, as the cereal leaves the stomach more slowly, and finally the digestive organs of the child are educated to digest starches, so that later he may be given cereals to eat.

Barley water may be prepared from pearl barley or from barley flour. In either case, I tablespoonful of the barley and a pinch of salt are added to I quart of water and boiled down to I pint, in a double-boiler, adding water if the amount decreases too fast; the process should take two hours. When done it should be strained through cheesecloth. If not used at once, it may be kept on ice. Thick barley water is made in the same way, except that twice the amount of barley is used.

Rice Water and Oatmeal Water.—These are made just as barley water is, with the exception that the oatmeal water cannot be strained through cheesecloth. One must use a coarse sieve. Oatmeal water is considerably more laxative than the others, and is of value when an infant is inclined to be constipated.

Protein Milk.—To 1 qt. of raw, sweet milk warmed to 100° F., 4 teaspoonfuls of liquid rennet, or 1 junket tablet, is added. This mixture is then kept at room temperature until it has firmly "set" into junket. This junket is cut into small cubes and the mass poured into a cheesecloth bag and hung in a cool place where it is allowed to drain for two hours. The whey which drains off is discarded. The curd is pressed through a sieve and one layer of cheesecloth by means of a potato-masher, from time to time adding boiled water until a pint has been added. To this curd suspended in 1 pt. of water is added 1 pt. of buttermilk. The resulting mixture is protein milk. It has a caloric value of 13 per ounce. Saccharin, 1 gr. to the quart, may be added to make the mixture more palatable. In warming protein milk before giving it to the baby, care must be taken not to heat it much above body temperature, as greater heat hardens the curd. A nipple with a large hole is essential as the milk is much more bulky than most formulas.

There are on the market several dried preparations, which, when mixed with water, skimmed milk or buttermilk, make a fairly satisfactory protein milk.

Protein milk is much used in the treatment of intestinal diseases, particularly diarrhea and chronic intestinal indigestion. As these conditions improve, the formula is often strengthened by the addition of a carbohydrate, of which dextrimaltose is best suited to the purpose.

Reënforced Protein Milk.—This is made exactly like protein milk except that no water is used, its place being taken by buttermilk. Thus the composition is: curd from 1 qt. of milk, 1 qt. of buttermilk. This mixture is more concentrated and has a higher caloric value than protein milk. It is of value in some cases of vomiting and diarrhea.

Dried Junket.—Dried junket or curd is often taken readily by

a child who will not take the same curd mixed with water and buttermilk. It is made by draining the whey from junket, as is done in making protein milk, and is fed with a spoon as one would a cereal.

Buttermilk.—Many dairies now supply buttermilk with known percentages of fat for use in infant feeding. If none such is available, it may be made at home. To a quart of milk is added a culture of lactic acid bacilli, and the mixture is incubated at from 80 to 100° F. until the protein is coagulated (twelve to twenty-four hours). It is then churned or beaten with an egg beater until smooth, and strained through a fine, wire sieve. The fat content can be varied by using whole milk or skimmed milk as desired.

Dried Milk Powders.—During the last few years there have come into quite general use a number of brands of dried milk. These have been extensively advocated for infant feeding. While they by no means take the place of good dairy milk, they fill a real need in supplying a food where good, fresh milk is not available, especially when traveling. One tablespoonful of powder added to an ounce of boiled water makes a mixture equivalent to undiluted, partially skimmed milk.

Condensed Milk.—This is still widely used in infant feeding. With increased knowledge of the preparation of formulas from fresh, whole milk its use will become less. The advent of dried milk removes the only valid argument in favor of condensed milk, which was its convenience when traveling.

Proprietary Baby Foods.—These foods, of which there are many on the market, should never be used without a very clear understanding of their limitations. None of them is a complete food. The dextrimaltose foods are sometimes valuable in modifying cow's milk, replacing, in these cases, the cane sugar or lactose.

Farina.—Two tablespoonsful of farina or cream of wheat and a pinch of salt are sprinkled into 10 oz. of boiling milk. This mixture is stirred until thick and smooth, and then al-

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lowed to cook for two hours in a double-boiler. It is fed with a spoon, usually with some milk from the bottle poured over it.

Beef Broth.—One pound of lean beef is chopped fine, taking care to remove all gristle. It is covered with 1 pt. of cold water and allowed to stand for an hour. It is then placed in a double-boiler, brought to 167° F. and kept at this temperature for an hour. Strain through a coarse, wire strainer, pressing as much of the juice from the meat as possible. All fat is then skimmed from the broth. Add enough salt to season.

Vegetable and Beef Broth.—Make beef broth as above, and to it add as many of the following vegetables as are available: peas, string beans, carrots, 2 tablespoonfuls each, spinach $\frac{1}{2}$ cup. Let simmer for an hour, and strain.

CHAPTER VII DIETS FOR OLDER CHILDREN



CHAPTER VII

DIETS FOR OLDER CHILDREN

In outlining diets for children after the bottle days are over, the same difficulties are met with as were encountered with the sucklings. Children vary and their food must vary. The diets set down here are ones which have been found satisfactory in the great majority of a large number of normal children. They are meant to be suggestive—nothing more.

Diet for a Child from ten to fourteen months of age

- 6 A.M. Whole milk, 8 oz.
- 9 A.M. Orange juice, 2 oz., or occasionally prune juice, if there is a tendency to constipation.
- 10 A.M. Cereal, 2 tablespoonfuls with a little milk, but no sugar. Well-cooked farina, cream of wheat, oatmeal, wheatena and cream of barley are among the best. (Do not give uncooked cereal.)

Milk, 6 oz.

Toast or zwieback, if still hungry.

2 P.M. Broth from chicken, mutton or beef.

Green vegetable—spinach, carrots, asparagus tips, young string beans.

Milk, 4 oz.

Toast or zwieback.

6 P.M. Cereal as above.

Milk, 6 oz.

Apple sauce, baked apple, pulp of stewed prunes.

Toast or zwieback.

10 P.M. Milk, 8 oz. (may be omitted any time after 1 yr.).

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Diet for a Child from fourteen months to two years

6 A.M. Milk, 8 oz.

8 A.M. Orange juice, apple sauce, baked apple or pulp of prunes.

Cereal, as in the preceding diet.

Bacon, 1 slice, well-crisped.

Milk, 6 oz.

Toast or zwieback

I P.M. Broth, 4 oz.

Egg, soft-boiled or poached,

or scraped beef,

or white meat of chicken.

White vegetable—potato or rice

Green vegetable—spinach, carrots, asparagus, young peas or string beans, stewed celery.

Milk, 4 oz.

Toast.

6 P.M. Cereal

Milk, 8 oz.

Stewed fruit, as above.

Toast or zwieback.

Many children by the time they are eighteen months do very well on three meals a day, in which case the 6 A.M. feeding is discontinued, and the other meals given at 7 A.M., 12:30 P.M. and 6 P.M. In this case 8 oz. of milk are given at each feeding.

Diet for a Child from two to four years of age

Three meals are given, arranged about as follows:

Breakfast: Cereal, milk, egg and bacon, bread.

Dinner: Broth, meat, white vegetable, green vegetable, milk or cocoa, bread, dessert.

Supper: Cereal or milk toast, milk, stewed fruit, if not given at dinner.

This schedule may be filled in from the following:

Milk: Maximum amount 1½ pt. a day, including that used on cereal, etc.

If not perfectly sure of the milk supply, it should be boiled.

Cocoa: Made with milk may be substituted once a day for milk.

Cereal: Never give uncooked, ready-to-serve cereals. Farina, cream of wheat, wheatena, cream of barley, oatmeal, etc., may be used. They should be cooked at least two hours (but are best when cooked overnight) in a double-boiler. They should be served with milk or thin cream, but with little—if any—sugar.

Bread: Dry bread, at least three days old, toast, zwieback. Avoid hot rolls, hot bread and fancy breads of all kinds.

Meats: Beef, lamb, lamb chops, chicken. Should be broiled or boiled or roasted, and served finely divided. Bacon should be fried until crisp.

Eggs: Soft-boiled, coddled, poached, scrambled or omelet.

Soup: Light soups with green vegetables, cooked three hours or thick soups well-strained.

Vegetables: Potatoes, baked, mashed or creamed (avoid use of new potatoes). Rice, thoroughly boiled. Macaroni or spaghetti may occasionally be substituted for potato or rice. Spinach, carrots, asparagus tips, string beans, young green peas, celery, cauliflower—cooked until tender, strained through a colander and served in their own juices, with a little salt.

Fruits: Orange juice, baked apple, apple sauce, stewed prunes.

Desserts: Junket, custard, fruit gelatin, vanilla ice cream.

Omit tea, coffee, soda water, cake, candy, pastry, salads, tomatoes, corn, cucumbers, melons and other articles of food not mentioned in the above list.

To some this diet may seem too strict, and it must not be taken too literally. Certainly most four-year-olds are not hurt by an occasional piece of candy or simple cake. On the

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other hand, they are not benefited thereby and may develop the candy habit, which is hard to overcome.

A few general rules which I have found valuable in feeding children may not be amiss here:

- 1. Do not urge the child to eat. This is the most important rule, observance of which will avoid many an upset.
 - 2. Do not make substitutions in his diet to please him.
- 3. Do not feed him between meals, even if he has refused the the preceding meal.
 - 4. Do not feed him candy or cake.
 - 5. Do not feed him raw fruits, except orange juice.
 - 6. Do not feed him tea, coffee or soda water.
 - 7. Do not feed him pork products, except bacon.
 - 8. Do not feed him fried foods.
 - 9. Do not feed him uncooked cereals.
- 10. Do not give him ice water, but offer him good cool water frequently.

Appetite is the only tonic for children, and fresh air is the best producer of appetite.

CHAPTER VIII DIAGNOSTIC METHODS



CHAPTER VIII

DIAGNOSTIC METHODS

In order to treat any child intelligently, the physician must first know what is the matter with the patient. And it is right here that pediatrics presents unusual difficulties, for—unlike the adult—the child cannot, as a rule, describe his symptoms in a way to be of any assistance in the diagnosis. The history of the case is of value, but more than anything else the physician must depend upon his own observation of the child, and upon the observation of the parents or nurse who are in attendance over a longer time than he can possibly be. In consequence, a nurse who observes a child intelligently, and who knows what to look for, can be of the greatest assistance to the physician in arriving at a proper diagnosis. Furthermore, the nurse—particularly if she has been with the child long enough to gain his confidence—can be of great service in smoothing the way during an examination.

Taking the Temperature.—In all children up to six or eight years of age, and in sick or nervous children above that age, the safest and most accurate method of taking the temperature is by rectum. For this purpose a clinical thermometer, having a large rounded end, is used so as to lessen the chance of injury. Also, the thermometer is usually distinctively colored so that there can be no possibility of confusing it with others which are used in the mouth. In taking the temperature, the bulb of the thermometer is well lubricated with vaselin and is inserted for about one and a half inches into the rectum. The ordinary "one minute" thermometer should be left in place for three minutes. As the rectal temperature runs about a degree higher than that taken by mouth, the nurse should al-

ways specify how any given temperature was obtained. Temperatures taken in the groin or axilla are so untrustworthy that they should be discarded.

Counting the Pulse.—The child's pulse may be taken at the wrist or in front of the ear. The quality, as well as the rate,



Fig. 9.—Taking the Rectal Temperature.

should be noticed as it is more easily observed and is of equal importance. As the pulse rate increases with exertion or excitement, it is wise to take the pulse while the child is asleep, if possible. The rate in disease is sometimes so much increased as to make accurate counts impossible: it is seldom that one can be certain of a pulse which is running more than 180 per minute, as it frequently does—for example in pneumonia. In premature babies

it is often impossible to count the pulse without a stethoscope, in which case it is counted by placing the instrument over the apex of the heart.

Counting the Respirations.—Sometimes a child's respirations may be counted just as an adult's—by holding the watch in line between the eyes and the chest and watching the inspirations. Often, however, it is necessary to place a hand upon the chest—to feel it rise and fall, at the same

time keeping the eyes on the watch. Here again excitement increases the rate, so it is important that the observation be made with the child at rest or asleep.

Weighing the Child. —This is as important a part of examination as taking the temperature, and with infants and young children should not be omitted. The infant scales usually found on the market. which work with a spring and on which the weight is shown by needle and dial, are so difficult to use and so inaccurate that they should be discarded in favor of balance scales. Scales such as grocers use, graduated to quarter ounces or to ten grams, and provided with a large scoop in in which the infant may be laid, are ideal. For older children, a platform scale is indicated.



FIG. 10.—BABY HELD FOR EXAMINATION OF THROAT. Both wrists are securely held in the left hand, while the head is drawn back with the right.

Weights should be made stripped or, if any covering is used for the baby, this covering should be carefully weighed and this figure subtracted from the total weight.

Holding a Child for Examination.—Many children object very strenuously to having the mouth and throat examined and this procedure can be very much simplified by the nurse if she holds the child properly. Whether the child be on her lap or on the examining table, the method is the same. The child's back is held firmly against the nurse's chest. The nurse then slips her left arm over the child's left shoulder, holding both of the child's wrists in her left hand. Her right hand is then placed upon the child's forehead, and the head drawn back against her right shoulder. When so held, the child finds resistance useless and usually acquiesces without further ado.

Wrapping a Child for Examination.—When it becomes necessary to hold a child securely over a prolonged period, as when examining the ears or eyes, it is often necessary to wrap



FIG. 11.—PATIENT WRAPPED FOR EXAMINATION OR TREATMENT.

him. The patient is placed upon a small blanket, reaching from his head to his feet. The legs should be straightened out with feet together; the arms should be close to the sides. If the nurse stands on the right side of the patient, the edge of the blanket nearest her is then passed over the child and tucked snugly under his left side—from axilla to feet. This pins the right arm firmly to the body but leaves the left arm free. The far edge of the blanket is then brought over the child, confining the left arm to the side, and is securely pinned with three safety pins. The child is thus trussed up in such a way that he can move neither arms nor legs, and the examination may proceed.

Method of Collecting Urine.—In children too young or too ill to use a bed-pan or chamber, some special method must be

employed for collecting urine specimens for examination. With boys, a test tube may be held in place over the penis with adhesive straps. With girls, enough urine for examination can usually be obtained by means of a small cup made of rubber sheeting and lightly filled with absorbent cotton, held in place over the vulva by the diaper. When specimens for bacteriological examination are needed, the child must be catheterized.

Method of Collecting Stools.—Usually the stool as caught by the diaper is satisfactory for laboratory examination. In cases of diarrhea, and in difficult feeding cases, the soiled napkins should be saved in a tightly closed receptacle for examination by the physician.

Vaginal Examination.—Girls and girl babies should never be admitted to a ward without a vaginal examination, which must include a smear for microscopic examination. The nurse prepares the patient as follows: the necessary clothing is removed and the patient placed upon her back with heels drawn up close to the buttocks and knees widely separated. The legs and abdomen are then covered with large towels or sheets. The nurse then dons rubber gloves. With the thumb and forefinger of the left hand, she holds the labia apart. A bichlorid solution I:10,000 on cotton pledgets is then used to cleanse the parts, always stroking toward the rectum, and using a fresh pledget for each stroke. Three pledgets should be used. The nurse continues to hold the labia apart while the physician makes the examination and the necessary smears. The smears may be made by means of sterile toothpick swabs, which are introduced into the vagina and then rubbed gently on slides. Perhaps the dropper method is better. A few drops of 1:10,000 bichlorid solution are taken up in a sterile dropper. These are gently forced into the vagina and drawn again into the dropper. This is repeated several times, and the fluid thus obtained is dropped on to a slide and allowed to dry. In suspicious cases, smears made on at least two successive days should be negative for gonococci before the patient is released from isolation.

Observations on the Part of the Nurse.—The success of a nurse in pediatrics depends on three things: the way she carries out the routine care of the child; the degree to which she can aid the physician in various diagnostic and therapeutic procedures; and finally the keenness and accuracy of her observation of the child. This last requirement is the most difficult to acquire, and comes only after some time spent in caring for children.

Routine Observations.—Certain things must be noted by the nurse in practically all cases, and generally they are made compulsory by the necessity of filling out charts and records. These are temperature, pulse, respirations, stools, urination and vomiting. In addition, one can scarcely help noting whether the infant is sleeping or wakeful, crying, fretful or contented, whether or not he is coughing and whether he is hungry or refuses his food. These things even a beginner with children will notice.

General IVell-being of Patient.—It requires very much more experience to be able to tell whether a child is better or worse, to know when there has been a change which should be brought to the attention of the physician, and to sense those situations which sometimes arise in which immediate action must be taken. Practice will enable the nurse to interpret the meaning of the color of the child, the rosy tint of health, the waxen pallor of anemia, the dull lead-gray of prolonged diarrhea and the bluish tint of respiratory failure. She will learn to distinguish the firm, elastic tissues of the normal child, the boggy, water-filled tissues in edema, and the dry, powdery, inelastic skin which shows rapid loss of weight.

Changes in Condition.—In addition to noting the general condition of the patient, the nurse must be quick to appreciate changes in his condition. She must recognize increased prostration or restlessness. She must realize at once that a child with pneumonia who becomes pale and cold is in danger. She should be on the lookout for discomfort due to a gas-

filled intestine, and must be watchful for distention of the bladder.

Eruptions.—Any breaking-out on a child's skin may be of importance, and when such develops it should be called to the attention of the physician at once. When a rash is seen, there are certain things which must be noted. One should determine its distribution—on what parts of the body it is found. The character of the separate spots—whether level with the skin, raised, filled with serum or pus—their size and number should be noted. One can also decide from the action of the child whether or not the eruption itches or is painful.

Parasites.—In institutional and welfare work, the nurse should always be on the lookout for parasites in the hair or clothing. This vigilance is for her own protection as well as for the good of the patient and those who associate with the patient. The most common of these parasites is the Pediculus capitis or head louse, which inhabits the heads of a large proportion of children, particularly the girls, who come to free dispensaries. Their presence can be detected, even when they are not seen themselves, by noting the nits or eggs. These are minute, pearlike bodies, so tightly glued to the hairs that they do not slip along them as do flakes of dandruff. A search for nits should be made on every child admitted to a hospital and, if they are found, treatment should be started at once to eradicate them and the child should be isolated until free from both parasites and eggs.



CHAPTER IX THERAPEUTICS OF INFANCY AND CHILDHOOD



CHAPTER IX

THERAPEUTICS OF INFANCY AND CHILDHOOD

Drugs play a very small part in the treatment of children. There are but few diseases which can be cured by medicines and not many more in which medicines are of real value in meeting unfavorable symptoms. This does not mean, however, that our hands are tied and we must leave all to nature. Far from it! Nowhere is the response of the patient to proper treatment as rapid and as gratifying as with children. And the first requisite of this treatment is good nursing care—either on the part of the mother or the nurse.

This chapter will deal with those methods of treatment which are in general use or of particular value, and whose use is not specially limited to any one condition. Methods of treatment which are of use in practically only one disease, such as intubation in laryngeal diphtheria, will be taken up in dealing with those conditions.

Mustard Pack.—One ounce of powdered mustard is dissolved in a little cold water and added to I gallon of water at 108° F. A sheet is wrung out of this mixture and wrapped about the nude infant, who is laid on a bed protected with rubber sheeting. The patient is then covered with blankets and an icecap or cold compress placed on the head. The child is left in the pack for from ten to fifteen minutes. At end of that time he should be wrapped in warmed blankets. This is an extremely valuable emergency measure in case of convulsions.

Mustard Plaster.—One part of mustard is mixed with six parts of flour, moistened and spread between pieces of muslin the size desired. Before applying, rub the skin with vaselin. Leave on until the skin is pink. If carefully used, it may be

repeated several times a day. It is much used in bronchitis and pneumonia.

Enemas.—Many sorts of enemas are in use for various purposes. Their administration is made much simpler if one has the proper equipment. This consists of an enema bag, an adjustable pole on which to hang the bag, a small hard-rubber nozzle or small catheter, a fairly firm pillow, extra rubber and sheet, diapers and bed-pan. The bedcovers are turned down and the child laid upon the pillow, which together with the bed is covered with rubber and sheet. The child's buttocks are placed upon the bed-pan, the edges of which are covered with diapers. After all the air has been expelled from the tubing, the nozzle or catheter is lubricated with glycerin or vaselin and inserted well into the rectum. The desired amount of fluid is then allowed to run in, and the nozzle removed. The expulsion of the fluid may sometimes be aided by very gentle massage of the abdomen.

The most frequently used enemas are:

Soapsuds, made by dissolving Castile or other bland soap in water at 100° F. From 4 oz. to a quart are used, depending upon the size of the child.

Water and glycerin, used where an immediate action is desired, particularly when the child has shown a tendency to retain the soapsuds enema. Equal parts of water and glycerin are used.

Mineral oil, used when the feces are particularly hard.

For small infants sufficient fluid can often be given with an all-rubber ear syringe, in which case the more complicated enema apparatus is dispensed with. Such a syringe may also be used in administering drugs by rectum—notably chloral—which is sometimes thus given for convulsions, and quinin.

Rectal Irrigation.—Salt solution at a temperature of 100° F. is used. The patient is placed on his back in bed, with hips supported by a pillow (this and the bed must be well protected with rubber sheeting). The solution is introduced into the rectum

from the enema bag by means of rubber tubing and a two-way rectal tube, or two catheters—a smaller for inflow and a larger for return—may be used. Outlet tube is shut off until about 6 oz. of fluid has been given, when it is allowed to drain off into the bed-pan. This process is repeated until fluid returns clear. This usually takes about a gallon of salt solution. This procedure is frequently employed where a thorough cleansing of the colon is desired.

METHODS OF ADMINISTERING FLUIDS

There are many diseases of infancy in which the condition of the patient may become exceedingly grave simply from loss of fluids from the body. This is particularly true in cases where there is a profuse, watery diarrhea, or in which there is prolonged vomiting. In such cases the life of the patient frequently depends on being able to supply the body with fluids in some manner so that they may be retained. There are several methods at our disposal.

Hypodermoclysis.—This is the giving of fluids into the loose subcutaneous tissues through a hypodermic needle by force of gravity. Sterile normal saline is the solution usually used. The site chosen for injection may be the abdominal wall, the thigh, or the region about the scapula. The apparatus needed is a graduated glass infusion bottle, rubber tubing, long large hypodermic needle, clamp, hot-water bags, gauze handkerchiefs, and adhesive tape. Exactly the same precautions as to sterility should be observed as for a surgical operation. The fluid to be given, heated to 100° F., is kept warm by surrounding the bottle with hot-water bags and covering the whole with heavy towels. The spot chosen for the injection is cleaned up with iodin and alcohol. All air is carefully expelled from the tubing and needle, and the tube clamped off. The needle is then inserted through the skin and run for some distance beneath the skin in the subcutaneous tissue. The clamp is then removed and the fluid allowed to run. As it usually takes from one to two hours for the desired amount of fluid to flow, the needle and surrounding tissues may be covered with sterile gauze handkerchiefs, strapped in place with adhesive. A strap of adhesive may also be used to hold the tubing firmly in place, so as to prevent the needle from slipping out. As the fluid flows in faster than it can be absorbed, a swelling gradually forms about the point of injection. The nurse can hasten absorption by gentle massage of this swelling.

Intravenous Injection.—This is similar to the subcutaneous administration just described, except that the fluid is injected directly into the circulation by running the needle into a vein. This is a more rapid method than the former, in spite of the fact that a smaller needle is used. It often requires considerable skill to introduce a needle into the vein of an infant, and recently it has become customary to introduce fluids by running a specially constructed needle through the anterior fontanel into the longitudinal sinus—a large vein running close to the surface. Glucose solution, as well as normal saline, is given by the intravenous method.

Intraperitoneal Injection.—A rapid and relatively painless method of giving saline solution is to inject it directly into the peritoneal cavity. Care is taken that the bladder is empty, the skin below the umbilicus is cleaned up and a blunt needle pushed through the abdominal wall into the peritoneal cavity. With proper care, no injury to the intestines results. From 3 to 8 oz. (75 to 250 c.c.) of sterile saline solution may be given this way for several days in succession. This also should be regarded as a surgical procedure and carried out with full surgical technic.

Nasal Drip.—This method, which has but recently come into general use, is extremely valuable in giving fluids. A very fine rubber catheter is passed through the nose into the stomach and is held in place by strapping the catheter to the upper lip or cheek with adhesive. This catheter is connected by rubber

tubing to an infusion bottle. In the tubing is placed a drop counter. From 10 to 20 drops a minute of water or glucose solution may be given in this way over a considerable length of time. In order to prevent interference with the tube, the child's hands should be fastened to the bed by means of muslin bands about the wrists. The tubing should be well lubricated with albolene to prevent injury to the delicate membranes of the nose; and where the tube is retained for considerable time, it should be changed each day from one nostril to the other.

Rectal Drip.—The so-called Murphy drip consists in giving fluids into the rectum through a fine catheter so slowly that they are absorbed rather than expelled, as in the case of an enema which is given more rapidly. About 15 drops a minute may be given in this way. The fluids are kept warm by means of hot-water bags hung about the container which holds the fluids.

Rate of Flow of Fluids.—The simple glass device, which is used to measure drops when fluids are given by nose or rectum, is fairly accurate; however, particularly in giving glucose solutions, there is a tendency for the rate to decrease gradually after a half hour or so. For this reason frequent readings should be taken to make sure that the flow is at the proper rate. There is a simple way to check up on this rate. Fifteen drops per minute are approximately equal to 2 oz. (60 c.c.) per hour. If more than 2 oz. has flowed in an hour, the rate of 15 drops per minute has been exceeded. More often less flows than is expected, due to the gradual diminution in the flow.

Transfusion.—The giving of blood into the vein of the patient is finding increasing fields of usefulness. It is also becoming a relatively simple operation. Blood from the donor is drawn into specially prepared flasks or syringes. A needle is then inserted into the patient's vein and the blood administered by means of a syringe. Transfusion is valuable in hemorrhage from many causes, and in certain toxic conditions.

Lavage.—Washing of the stomach by means of a tube passed through the mouth and down the esophagus is a relatively simple and very valuable procedure. It is used in cases of poisoning and in many cases of indigestion with vomiting. It always precedes gavage, which is the giving of food by tube. The apparatus used consists of a funnel, holding about 4 oz., attached to three or four feet of rubber tubing, which in turn is connected by a piece of glass tubing to a rubber catheter or stomach tube. One needs in addition a medicine glass containing glycerin, a mouth gag, a rubber bib, a curved basin, a bowl and a pitcher containing fluid to be used in washing the stomach.

The child is securely wrapped to avoid a struggle and is protected by the rubber bib. The stomach tube is moistened with glycerin. The first finger of the left hand is slipped in at the angle of the mouth and the tongue held down. Then with the right hand the tube is slipped quickly into the mouth. When the tip hits the posterior wall of the pharynx, it turns and slips readily into the esophagus. The tube is then pushed rapidly until it reaches the stomach. One must, of course, be sure that the tube is in the esophagus and not in the trachea; if in the latter, there is a rush of air through the tube with each respiration, which is readily recognized. If in the trachea, the tube must be promptly removed. This, however, is an accident which rarely happens as it is in fact very difficult to introduce a tube into the trachea.

When one is sure the tube is in the stomach, the washing commences. For this, either water or a solution of sodium bicarbonate is usually used. The funnel is held two feet above the patient, and several ounces of fluid poured in. The tube is then lowered and the contents of the stomach siphoned off. This is repeated several times until the fluid comes away clear. Usually a quart of fluid is sufficient. If during the process the child starts to gag, vomiting can usually be prevented by pulling the chin sharply forward and upward. When the washing is finished, the tube is pinched tightly, to prevent the escape of fluids into the pharynx, and quickly withdrawn.

Lavage is a procedure which the nurse may do under direction of a physician. She should, however, never do the first lavage on a given patient, as there are occasionally children who present special difficulties.

Gavage.—Tube feeding is carried out almost exactly like lavage. In fact, washing almost always precedes the administration of food. After the stomach has been thoroughly washed, the milk, or whatever food is to be given, is poured into the funnel and allowed to run into the stomach. When the desired amount has been given, the tube is removed as in lavage. The food should be given at body temperature. This method of feeding is used in premature babies who are too weak to nurse, in patients who are comatose and in many other cases where for some reason food cannot be taken in the usual way. When this method of feeding is used, the interval between meals should be as long as possible.

Inhalations.—These consist of steam, sometimes medicated with volatile substances. They are used in croup, bronchitis and other diseases of the respiratory tract. In order to be of value, the air breathed must be saturated with the vapor, so it is necessary to confine this to a small place. A good croup tent can be made by covering a crib with a double sheet. Heavy cord is run from the top of the head to the top of the foot of the crib, on each side, the double sheet drawn over these cords and fastened securely to the mattress all around. The vapor is introduced through a metal pipe from the croup kettle or vaporizer. These kettles must be carefully watched, as there is constant danger that they may be upset, or become clogged and explode. Those which are heated by electricity are less dangerous than those with an alcohol lamp.

A simple emergency tent may be made by throwing a sheet over an umbrella. This method is particularly recommended in the case of a nervous, easily frightened infant, who may become terror stricken if alone in the ordinary tent. In such a case, the mother or nurse may sit in a comfortable chair with

the child in her lap. The umbrella is opened and fastened to the back of the chair, and over this is placed a sheet, so that it falls to the floor on all sides. The croup kettle is then placed on the floor at the nurse's feet. In this way the nurse can constantly watch the vaporizer, and can judge of the intensity of the vapor.

Plain steam may be used for inhalations, or it may be made more effective by the addition of various substances, as compound tincture of benzoin, menthol, alcohol, and so on. In using the ordinary croup kettle, these substances are dropped on to a pad of cotton at the top of the kettle, through which the steam passes.

Irrigation of Ears.—The ears in childhood are particularly susceptible to infection, and often the ear-drum ruptures or is punctured and pus is discharged. The comfort of the patient and the speed of healing are much influenced by keeping the canal of the ear free from pus. To do this, the canal is syringed with some solution such as boric acid. If the patient is young, he is securely wrapped to prevent struggling, a piece of rubber sheeting is placed over the shoulder, and over this a towel. A curved basin is pressed firmly against the neck below the ear. The irrigation should be done with an allrubber ear syringe. The outer ear is drawn firmly backward, and the tip of the syringe inserted well into the canal. The solution is then forced sharply into the canal. This is repeated until the fluid which flows out is free from pus. About 6 oz. to each ear is usually needed. After syringing, the canal should be carefully dried and anointed with vaselin or some bland ointment to protect the skin from the irritating effects of the discharge.

Drugs.—As was mentioned in the introduction to this chapter, drugs do not play a large part in the treatment of children. A few, however, are of value and they fall for the most part into groups:

Antipyretics, or drugs used to reduce temperature, are, as a

rule, not as efficient for this purpose as cold sponges or baths; however, phenacetin and antipyrin often make the fever patient more comfortable.

Sedatives, or drugs used to quiet the nervous system, are often of great value. Those most used with children are sodium bromid and chloral. The latter is usually given per rectum, as it is irritating to the stomach.

Opiates, or drugs derived from opium, are used to relieve pain, to produce sleep and to stop convulsions. Those best adapted to infants and children are morphin, codein, and paregoric. The first two are usually given hypodermically.

Stimulants are occasionally needed. By far the best emergency stimulants for children are caffein and adrenalin. These are given hypodermically. Where stimulation of the heart is desired over long periods of time, the various preparations of digitalis are of value.

Tonics are sometimes a help in anemia. Iron, either as bitter wine, or as reduced iron and preparations of arsenic, particularly Fowler's solution, is used in these conditions. Tincture of nux vomica, often combined with some such bitter medicine as compound tincture of gentian, is sometimes used to stimulate the appetite in older children.

Laxatives should be avoided wherever possible by the properregulation of the diet. Where a thorough cleaning-out is desired, preference should always be given to mechanical means, such as enemas or suppositories. If it is felt necessary to use a drug, the milder preparations are preferable to the violent doses of calomel and castor oil of our forefathers. Milk of magnesia for infants and, for older children, citrate of magnesia, fluid extract of cascara or syrup of rhubarb are perhaps as satisfactory as any preparations.

Dosage.—The amount of any drug to be given depends on a number of factors, particularly the age and size of the child, and the particular reason for which the drug is given. One cannot lay down rules and say that the dose for an adult being

so and so much, the dose for a child will be such and such. Children need proportionately much less of some drugs and more of others than their parents. Moreover, no table of dosages can be regarded as absolute, as the individual child and the disease must be taken into consideration. But the following table gives approximate doses for average children at various ages:

Approximate Doses for Average Children at Various Ages

Adrenalin (1:1,000 solution) 3 min. 5			
Antipyrin	3 min. ½ min. 5 min. ½ gr. 1 dr. 60 gr. 1 min. 8 min. 1 gr. 15 min. 3 gr.	2 gr. 3 min. 20 min. 3 gr. 15 gr. 1 fl. dr 1/10 gr. 5 min. 3 min. 10 min. 2 gr. 1/2 dr. 4 oz.	1/6 gr. 10 min. 5 min. 20 min. 5 gr. 1 dr.

BIOLOGICAL PREPARATIONS

In addition to drugs there is a group of bacteriological substances which are of increasing importance in treatment. These are the antitoxins, vaccines and serums. They are made either from bacteria or are produced in the body in response to the action of bacteria.

Diphtheria Antitoxin.—This preparation is produced by injecting horses with small doses of toxin from diphtheria bacilli. These doses are gradually increased until the animal develops a high degree of immunity. Blood serum from an animal so treated is standardized in such a way that a given amount of it contains a known amount of protective substance. The strength of the serum is measured in units. The antitoxin may be given subcutaneously, intramuscularly or intravenously, depending on circumstances. It is used in the treatment of diphtheria, being given as early as possible in the course of the disease. An average dose for a year-old child in the first day of the disease would be 3,000 units. It is also used prophylactically to prevent the development of the disease in persons exposed. In this case 1,000 units or less are given. The protection afforded by such a dose lasts only a few weeks.

Diphtheria Toxin-Antitoxin.—Diphtheria toxin-antitoxin treatment, if carried out on a large scale in our schools, would soon put an end to epidemics of diphtheria. It has been found that humans, as well as horses, can be made to develop antitoxin, and that the antitoxin which an individual develops within himself gives him permanent immunity from the disease. By giving several injections of toxin combined with antitoxin the individual can be made immune with little or no unpleasant reaction.

Antimeningococcus Serum.—This is prepared in a way somewhat similar to the diphtheria antitoxin. Its action, however, is somewhat different in that it is effective only when it comes in contact with the bacteria causing the disease. As these organisms are found in the fluids surrounding the brain and spinal cord, the serum is injected by means of a lumbar puncture, or a puncture of the ventricles of the brain. The serum is of value only in that type of meningitis which is caused by the meningococcus.

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Vaccines.—Vaccines are killed cultures of bacteria, which are injected into the body in order to increase the resistance of the body to similar living bacteria of similar varieties. Their principal use in children is in cases of multiple infections of the skin, a condition known as furunculosis. In this case the vaccine is often prepared by growing bacteria found in the lesions, and making the vaccine from the organisms so grown. Such a preparation is spoken of as an autogenous vaccine.

Small-pox Vaccine.—This is prepared from the vesicles which appear on cattle in the disease known as cowpox. This virus is collected with special precaution as to cleanliness, and is put up in tiny glass tubes, each holding enough for one vaccination. A successful vaccination protects from small-pox for a number of years.

Thyroid Extract.—Preparations of dried thyroid gland are put up in tablet form. These substances are of value in cases of cretinism.

Insulin.—This preparation made from the pancreas is used in cases of diabetes. It is given hypodermically and its effect is so transient that it must be given frequently.

CHAPTER X DISEASES INCIDENT TO BIRTH



CHAPTER X

DISEASES INCIDENT TO BIRTH

THE changes which take place in the body of an infant at birth are very great. He must change at once from a nonbreathing organism, whose oxygen has been obtained from the mother's blood through the placenta, to an air-breathing creature, using his own lungs. The course of the blood through his heart must change, and an opening between the chambers of the heart, necessary to fetal circulation, must close. Instead of being in an environment of constant temperature, he must now regulate his own temperature. Where his food was furnished him by the maternal circulation, he must now take his own nourishment by mouth. The waste products of his metabolism which were filtered off through the placenta must now be excreted by way of the intestines, the kidneys and the lungs. Many of these changes must be made in a few hours, some in a very few minutes if the child is to survive. It is not surprising then that occasionally infants fail to adapt themselves to their new surroundings and consequently die; the surprising thing is that such a vast proportion make the transition successfully. Some of the more important conditions incident to birth will be taken up in this chapter.

Asphyxia Neonatorum.—The lungs of the unborn child are not air-containing. They are firm rubbery masses whose minute chambers must expand before they can supply the body with its necessary oxygen. Normally the child cries as soon as he is born, and this first cry opens the alveoli of the lungs and initiates respiration. A number of different things, however, may interfere with this process. The mother's cir-

culation may have been so poor, due to exhaustion, convulsions, or other troubles, that the child is born deficient in oxygen and with too little strength to cry. Prolonged labor with undue pressure on the head may have produced the same condition. Finally the cord may be wrapped tightly around the neck or may be pressed upon, as is the case in breach presentations, to such an extent that the circulation is cut off. When the child does not cry properly at birth and the lungs do not expand as they should, he is said to be asphyxiated. There are all grades of asphyxia from the child who needs but a few spanks to make him cry to the child who succumbs in spite of the most active measures of resuscitation. In the milder cases the child is blue and the muscles of good tone. In the severe cases the child is pale, relaxed, and may seem quite dead except for a faint beating of the heart.

Treatment.—In each case the mouth and pharynx should be cleared of mucus by means of pledgets of gauze held in clamps or fingers. The baby is then usually held up by the heels and smartly slapped upon the back. If this is successful, well and good, if not, more strenuous means are employed. The child may be emersed in a tub of water at 105°, then in a tub of cold water. He should be kept but an instant in the latter, then returned to the hot tub. By repeated stimulation in this manner, respirations may often be started. Artificial respiration may be carried on while the child is in the warm tub, or without the use of emersions. An easy and effective method is to grasp the shoulders of the infant in the fingers of the left hand so that the head falls back on the back of the hand; the right hand is placed under the knees. The infant can then be folded up, the pressure forcing air from the lungs, and opened out, thus drawing air into the lungs. This procedure should be carried out gently but firmly, about fifteen times per minute. The injection of adrenalin directly into the circulation is occasionally of value when the heart action is weak. It is most readily given directly into the heart itself.

Congenital Atelectasis.—Many cases of asphyxia recover entirely; in some, however, expansion of the lungs is not complete. The infant may breathe spontaneously and seem fairly well, but he nurses poorly, does not gain, and may become cyanosed on slight provocation, such as a stomach distended with gas. These infants cry feebly like premature babies and, as is the case with prematures, it is difficult to maintain a normal temperature.

Treatment.—This must be carried on along two lines. First, the general condition of the patient must be kept at the highest possible point by careful feeding and maintenance of body temperature. Secondly, means must be taken to increase as far as possible the expansion of the lungs. To this end the child should be made to cry vigorously two or three times a day. This may be accomplished by spanking, or by slapping the soles of the feet. The patient needs constant watching as at any time attacks of cyanosis may develop and artificial respiration be necessary. The continuous use of oxygen over several days is valuable in cases which are markedly cyanosed.

Jaundice.—Nearly one half of all babies develop jaundice during the first week of life. This yellowing of the skin usually appears on the third or fourth day and lasts for about a week. The smaller the child the more intense the staining is apt to be and the longer it is apt to last. This physiological icterus has little or no effect on the child's progress and requires no treatment. There is a rare form of jaundice produced by changes in the liver or bile ducts in which the coloring appears at birth, or within a few hours after, and becomes increasingly intense. These cases end fatally in spite of treatment.

Hemorrhages Due to Labor.—Prolonged labor often causes bleeding to occur under the infant's scalp, producing a large swelling on one side of the skull, well back toward the occiput. Such swellings while disfiguring at first, need no treatment and disappear spontaneously in two or three months.

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In breach presentations there is occasionally a hemorrhage into the sheath of the sternomastoid muscles, which causes a hard knotlike mass to develop about the center of this muscle. For a time the head may be drawn slightly toward the affected side, but gradually both the mass and the deformity disappear. No treatment is necessary, even massage being of doubtful value.

Spontaneous Hemorrhages.—Certain infants have a tendency to bleed, totally apart from any difficulty or accident at birth. Bleeding may start at any time during the first weeks of life and may involve any of the tissues of the body. Hemorrhages from the cord, into the intestine, or from the mouth and nose, are most common. The bleeding is usually gradual and is difficult to control. The patient rapidly becomes pale and prostrated. If untreated many of them die within a day or two. The course of the disease is always short, recovery or death in three or four days being the rule.

Treatment.—This consists in transfusion with the blood of some healthy person. About 50 c.c. of blood may be given either intravenously, intraperitoneally or subcutaneously. Injection into the umbilical vein would seem to be the most logical method of transfusion in the newborn. The dose may be repeated several times if necessary. Nothing is more dramatic than the improvement of such an infant when transfused. Within a few hours he changes from a waxy, pale, stuporous, dying infant to a rosy baby who can nurse and cry.

Ophthalmia Neonatorum.—Infection of the eyes at birth with the gonococcus is perhaps the most frequent infection of the newborn. The disease usually makes its appearance on the third day with swelling of the lids, redness of the nucous membranes of the eye and a watery discharge which soon becomes purulent. The discharge soon becomes very abundant so that there is almost a continuous flow of pus from the eyes. If untreated, damage to the eyeball usually results with blindness as an outcome. In fact before the days of modern prophy-

lactic methods, about one-fourth of all blindness was due to gonorrheal ophthalmia. Prophylaxis consists in dropping into the infant's eyes some 2 per cent silver nitrate solution. This method was devised by Credé and is called by his name.

When the disease develops either through failure to apply the silver nitrate, or, as rarely happens, in spite of its use, the most energetic measures must be employed to save the sight. The patient should be strictly isolated and the nurses on the case should care for no other patient. These cases are very exacting and where possible there should be three nurses on duty, each caring for the patient for eight hours. The nurse should wear cap, gown and rubber gloves. She also should wear large goggles so as to make it impossible for her in a thoughtless moment to put her fingers to her eyes. All cotton or gauze used in wiping away discharges should be placed in a paper bag and burned.

Treatment consists in keeping the eyes clean. The eyes should be irrigated with normal saline solution or boric acid solution as often as there is any accumulation of pus. If the lids are so swollen as to make irrigation difficult, iced compresses changed every few minutes are useful. This procedure should not be continued for more than eight hours at a stretch, as the continued use of cold may do damage to the eyeball. Twice a day some antiseptic solution should be dropped into the eye; argyrol, 10 per cent, or silver nitrate, 2 per cent, are frequently used. Atropin is used to keep the pupil dilated, thus preventing adhesions. Sometimes only one eye is involved; in this case the good eye should be painstakingly protected from infection. A watch crystal held in place by strips of adhesive plaster is valuable for this purpose. The general condition of the child must not be neglected, for a robust infant throws off the infection more readily than one who is puny.

Other Infections.—The newborn infant is more susceptible to infection than at any other time of life, and should be

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shielded accordingly. The umbilicus particularly affords an easy portal of entry for disease bacteria. It should, therefore, receive the most careful surgical care until entirely healed. Infections of the cord and surrounding abdominal wall, or widely scattered abscesses which occasionally occur in the newborn, are always serious. The treatment is surgical and depends upon the location of the lesions.

HERNIA

Umbilical Hernia.—Small hernias of the umbilicus are very common in poorly nourished infants under six months of age. When they develop in older children it is usually due to some



Fig. 12.—Treatment of Umbilical Hernia. The adhesive plaster strap is drawn snugly, and extends well back in each flank.

prolonged strain such as whooping cough. Treatment consists primarily in good feeding, as with gain in weight the tone of the abdominal muscles improves and the overlying fat tends to close the opening between the muscles. Of the mechanical measures of treatment, the best seems to be a wide adhesive strap applied across the abdomen snugly enough to hold the recti muscles together. A two-inch strip of adhesive is used,

long enough to reach well down into each flank. The patient is placed upon his back on a table with his abdomen well exposed and his knees held down firmly by an attendant. One end of the adhesive strip is applied to the far flank and rubbed till it adheres tightly. The strap is then pulled snugly across the umbilicus. This obliterates the swelling and covers it with a fold of skin. The free end of the strap is then rubbed down in the near flank. Such straps should be changed each week. In this way small hernias usually close entirely in six weeks, larger ones in three months. Various types of pads which are sometimes strapped over the navel probably do more harm than good, for, while they keep the intestinal loop out of the hernia sack, they prevent the return of the abdominal muscles to their normal position and so retard the perfect healing of the hernia.

Inguinal Hernias.—Infants, particularly boys, sometimes develop inguinal hernias within the first few days of life. Most of these disappear spontaneously in a few weeks with no treatment at all. If they do not disappear the hernia may be reduced and held in place by a simple worsted or stockinet truss. A band of either of these materials is passed around the waist and tied in a fore-in-hand knot. The end which tightens the knot is cut off, and the sliding end is passed between the legs and drawn down so that the knot presses firmly on the hernial swelling. The hernia is then reduced with the fingers, the truss pulled snug, and the free end tied behind to the band around the waist. Such a truss must be changed as often as soiled. The various rigid forms of trusses should be avoided as they irritate the child and are no more effective than the simpler and more comfortable type just described.

ABNORMALITIES

Harelip and Cleft Palate.—These congenital abnormalities may occur singly, but they frequently are associated. Modern

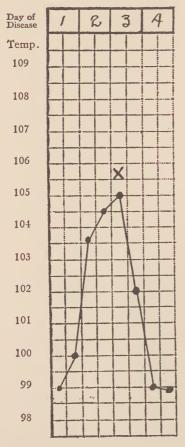


FIG. 13.—TEMPERATURE CHART OF INANITION FEVER. Patient aged 8 months, was given only the breast. Examination showed the mother had no milk. At X, fluids were administered by mouth and rectum with prompt return of temperature to normal.

plastic surgery works wonders in the repair of these defects. Operation is usually postponed until the patient is at least six months of age, and these first months are critical ones. The child as a rule cannot nurse satisfactorily and must be fed with a dropper or Boston Feeder. Occasionally tube feeding is necessary. Mother's milk should be used whenever possible, the mother expressing her milk as described in the chapter on Maternal Nursing.

Other Abnormalities. — Any part of the body may be involved in abnormal conditions. Some of these abnormalities are incompatible with life, the child dying in a few hours or days. Some, however, such as extra fingers or toes, are amenable to surgical treatment.

Birth Paralyses. — Difficult labors, particularly breach presentations, and cases in which instruments are used, sometimes result in damage to the nervous system which produces paralyses. There are numerous types, depending upon what part

of the nervous system is injured. Hemorrhages from the vessels of the brain may cause early death, or, if the child survives, widespread deformities of arms and legs. Stretching

or tearing of the nerves of face or arms may cause limited paralyses. In these cases marked improvement usually takes place during the first few weeks; after this time much can be done to prevent deformities by the use of massage.

Inanition Fever.—Newborn infants cannot go for long without water and food. If for any reason one is deprived of fluids, as, for example, when the mother's breast has gone dry, unknown to her, the infant reacts with an elevation of temperature which is known as inanition fever. This occurs most frequently during the first week of life, when a rise of temperature to 103° or 104° is not uncommon and should always make one question the milk supply. Besides the temperature, these infants show a dry powdery skin, rapid loss of weight, and prostration. If the condition is promptly recognized, and breast milk and water given, the return to normal is usually rapid. If the condition is allowed to continue, however, a fatal outcome is not long delayed. In older children the condition is rare but when once established is usually much more stubborn, frequently calling for the administration of fluids intravenously or subcutaneously.



CHAPTER XI RICKETS AND SCURVY



CHAPTER XI

RICKETS AND SCURVY

RICKETS

RICKETS is a widespread disease of infancy and early child-hood due to improper feedings. While the most noticeable changes it produces are in the bones and muscles, every tissue of the body is involved to some extent. It is the indirect cause of many deaths during the first two years, although it is seldom fatal in itself. It is preventable by proper care and feeding.

Etiology.—While many factors such as lack of cleanliness, fresh air and sunlight contribute to the changes in rickets, the underlying cause, without which the disease does not occur, is a deficiency in the food of a certain vital substance. We may speak of this as the "antirachitic factor" for want of a better term. This antirachitic factor is found in the milk of most mothers, in lesser degree in cream from cow's milk, in the yolk of eggs, and to a marked degree in cod-liver oil. When it is absent or decreased in the diet, rickets may develop. Children from six months to two years are most susceptible, although it may occur both earlier and later than this. It is more common in winter and spring; city dwellers are more susceptible than country dwellers; and the very poor, living in crowded tenements, more subject to it than those living in good hygienic surroundings. Colored infants and Italians in this country are particularly apt to develop it, as are premature infants of all races.

Symptoms.—The earliest manifestations of rickets are fretfulness, irritability and sweating, particularly of the head. These usually are noticed before the more marked symptoms

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which occur in the bones. There is a deficiency of calcium and phosphorus in the body, in consequence of which the bones become soft, particularly at the ends where growth takes place. In an attempt to strengthen these weak places, the body lays down more bone, and swellings form at the ends of the long bones. These may be noticed on the chest, where the ribs join the cartilages, as a row of knobs. Their similarity in marked cases to a string of beads has earned for them the name of "rachitic rosary." There are also enlargements at the wrists and ankles. The softened bones bend easily so that knock-knees, bow-legs and marked deformities of the chest are common. The skull also softens so that pressure over the occipital region may cause it to bend and crackle under the finger. The anterior fontanel remains open long after the eighteenth month. Teething is usually much delayed, the first tooth often not appearing until the child is twelve months old. The muscles lose their tone and become flabby, producing potbelly and a backward bending of the lower spine when the child sits.

Complications.—Rachitic children fall an easy prey to all forms of infection. They acquire diseases more often than normal children, they throw them off with greater difficulty, and succumb to them in larger numbers. They are particularly susceptible to colds, bronchitis and pneumonia, from which latter disease many of them die.

Diagnosis.—Diagnosis is made on the history of deficiency in the diet of the antirachitic factor, on physical findings such as beaded ribs and large epiphyses, on X-ray examinations of the bones, and on chemical examination of the blood for calcium and phosphorus.

Prognosis.—Rickets in itself is not a fatal disease, but it contributes largely to the death-rate, as it makes the patient more susceptible to other diseases. It is curable with proper treatment, though not always without some deformity remaining.

Prophylaxis.—Recent studies have shown that rickets is preventable. It seldom occurs in breast-fed infants when the mother is on a satisfactory diet, so that breast feeding whenever possible should be carried out through the first eight or nine months. In artificially fed infants, one should avoid the use of diets low in fat, such as condensed milk. Finally all artificially fed infants, and even breast-fed infants, if there is any doubt as to the quality of the breast milk, should receive regular doses of cod-liver oil. One may start with 5 drops of the yellow Norwegian or American oil three times a day to a three months old baby, increasing gradually till at a year the infant receives one-half teaspoonful three times a day. It is not necessary to disguise the flavor in any way, for, strange as it may seem, they like it. In older children eggs are a safeguard. Sunlight and fresh air are also deterrents to rickets, a liberal coat of tan being an excellent insurance policy against the disease.

Treatment.—Much that has been said under the head of prophylaxis applies as well to treatment. When a child is found to have rickets his whole manner of life must receive careful attention. Hygienic conditions, particularly with regard to fresh air and sunlight, must be made as near ideal as possible. The diet should be corrected so as to contain a liberal supply of good whole milk and, where age permits, fresh eggs. Cod-liver oil should be given, starting with a few drops, and increasing rapidly, if it does not upset the stomach or cause diarrhea, until the child is receiving a teaspoonful three times a day. In the warm months, the patient should receive daily sun baths. Infants may have their cribs placed on a porch or balcony, with a screen so arranged that the sun does not shine in the eyes, while the naked body gets the direct rays. The time of exposure requires careful supervision, care being taken that the child does not become burned. Older children may be allowed to run naked on the lawn or beach, the eyes protected by dark glasses if the glare is severe. In winter or

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in crowded districts of the city where sunlight is not available, much the same results may be obtained by the use of ultraviolet rays. The progress of the cure should in all cases be followed through frequent X-ray pictures or blood examinations.

TETANY

Tetany is a disease of the nervous system characterized by increased nervous excitability, a tendency to spasms of the larynx, hands and feet, and by convulsions. If not actually a manifestation of rickets, it is at any rate so closely connected with it that it must be discussed under the same head.

Etiology.—The etiology is the same as rickets. Like rickets it depends on decreased utilization of the calcium in the blood.

Symptoms.—Spasms of the hands and feet are the most common outspoken symptoms of the disease. The extended fingers are flexed on the hand which, in turn, is flexed at the wrist, while the thumb is held tight across the palm. In like manner the toes are sharply flexed. This combination is known as carpopedal spasm. Pain in the contracted extremities is usually present, and the child is very fretful. Spasm of the larynx also occurs and gives rise to a peculiar crowing inspiration when crying which is so characteristic that a diagnosis of tetany can be made without seeing the patient if this cry be present. General convulsions are also frequent. There are certain other signs which can be brought out on examination which are useful in making a diagnosis. In these cases, tapping of the cheek causes twitching of the corner of the mouth. This is known as Chvostek's sign. When carpal spasm is absent it may sometimes be induced by pressure on the upper arm. This is known as Trousseau's sign. Erb's sign is increased reaction of the patient to electrical stimulation. Finally examination of the blood for its calcium content is helpful.

Prophylaxis.—This consists in the prevention of rickets.

Treatment.—The underlying rickets must be energetically treated. The spasms may often be relieved by the free use of bromids and antipyrin. Morphin or chloroform may be necessary where there are convulsions. Finally calcium should be given until the symptoms disappear.

SCURVY

Scurvy is a metabolic disease brought about by certain deficiencies in the diet. It is characterized by hemorrhages from the gums and under the periosteum of the bones, by pain and failure to gain. It is preventable. If recognized in time and energetically treated, no disease yields so readily.

Etiology.—Scurvy occurs in artificially fed infants who receive no raw food. Particularly it develops in infants fed on the so-called "infant foods" and on condensed milk. Boiled or sterilized cow's milk is also a common factor. It is found in infants up to two years. Older children are not usually affected, although explorers and sailors who must live on diets lacking in vegetables and fruits are subject to it and often die of it. It is more common among the wealthy than among the poor, whose children usually "eat from the table" at an earlier age and so get a more varied diet.

Symptoms.—Stationary weight on a diet providing sufficient nourishment is the most common early manifestation of scurvy. This is followed by pallor and irritability. Soon the gums become spongy and tender and bleed easily. Swellings occur, particularly just above the knees, which are caused by bleeding between the bone and the periosteum. These swellings are very painful and cause the child to hold his limbs stationary in a slightly bent position. So disinclined is he to move that the parents frequently conclude that he is paralyzed. This condition is known as pseudoparalysis. If untreated, hemorrhages occur under the skin and also from the mucous membranes and the condition becomes progressively worse till the child

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dies of malnutrition, diarrhea, or some complicating infection.

Prophylaxis.—Every artificially fed infant should be given some raw food at least from the third month, unless some digestive disturbance makes this temporarily unwise. Orange juice is the most satisfactory and should be given daily, beginning with a teaspoonful in an ounce of water at three months, and increasing until the juice of half an orange is given at six or eight months. For older children vegetable juices, such as broth in which spinach, carrots, and string beans have been cooked, is valuable. Tomato juice may be used in the place of orange juice where strict economy is necessary.

Treatment.—Regulation of the diet so as to contain as much raw food as possible, with fruit juices or green vegetables in as large quantities as the child can tolerate, constitutes the essential part of the treatment. Where a safe supply of raw milk is available this should be used in preference to boiled milk. Infants of six months may receive orange juice, 2 oz. three times a day. To older children the juice from green vegetables or purées of green vegetables may be given. As these children are very apt to have digestive upsets, they must be watched with care so that the new diet does not precipitate an attack of diarrhea. In changing and bathing them the most solicitous tenderness is necessary, as any motion may cause intense pain. Tonics such as reduced iron and codliver oil are indicated, as soon as the acute stage is passed, to overcome the anemia which is present and improve the general condition.

CHAPTER XII DIGESTIVE DISORDERS



CHAPTER XII

DIGESTIVE DISORDERS

DIARRHEA

THE various forms of diarrhea constitute a very large part of the illnesses of young children. They are the bulk of the hot weather work in pediatrics. As the different types require much the same treatment they will all be considered together.

Etiology.—The popular name of "summer complaint" is well deserved by this group of diseases. They occur in their severe form almost exclusively in summer. Beginning in June the number of cases and their severity increase rapidly. July and August see the worst of the epidemic, while during September and October there are few new cases; and the more persistent of the old cases gradually clear up. The diseases are very widespread, occurring in all parts of the country. Crowded districts and those with poor hygienic conditions have the highest incidence. Neglect of maternal nursing, ignorance of proper feeding methods, and carelessness in the preparation of food are important factors. No age is exempt, though children under two years provide most of the serious cases. In dysentery causative bacteria have been found: the several members of the dysentery group. But in the other diarrheas there is strong probability that no particular organism is to blame.

Symptoms.—No description of the symptoms of diarrhea can fit all the cases, for these vary in intensity from slight indisposition with a few loose stools to rapidly fatal cases in which bowel movements are almost continuous. But between these extremes lie the great majority of the cases. Vomiting is a common initial symptom, and may be present throughout

the disease, particularly in dysentery. Colicky pain is another early symptom, an attack often preceding each movement. Fever is usually present during the first stages of the disease, but tends to drop to normal after the bowels have moved freely. In dysentery this temperature may persist for days. The character of the stools varies widely, and should be carefully noted and described by the nurse. The first stools usually contain largely fecal matter, soon they become frequent, watery, green or olive-colored. If there is much solid material it is apt to be frothy. The odor may be sour or extremely foul. The dysentery stool is characterized by the presence of mucus and blood. There may be definite streaks of blood on the diaper, but more commonly there is simply a pink tingeing of the mucus with which the stool is filled. There are never large hemorrhages.

The general constitutional reaction varies with the severity of the attack, particularly with the loss of fluids from the system, and with the success of the measures taken to replace these fluids. Depletion of the fluids is shown by a dry loose skin and weak pulse. Loss of weight is usually rapid, and in the prolonged cases may be extreme. Prostration and nervous manifestations often ending in convulsions occur in the more severe cases.

Complications.—Children who have suffered a severe attack of diarrhea are always in a debilitated condition and are particularly susceptible to attacks of other diseases. Otitis media, pyelitis, and furunculosis are common. For this reason the greatest care as to cleanliness and isolation should be observed in every case.

Acidosis.—In any disease in which there is prolonged starvation, or extreme loss of fluids and salts from the body, particularly in severe diarrheas, a condition known as acidosis frequently develops. It shows itself in restlessness followed by stupor and by increased deep respirations. Its presence may be confirmed by certain tests on the blood and on the expired air. Once a child has reached the stage of acidosis, the outlook is extremely grave, although not necessarily hopeless. The prompt administration of fluids intravenously, particularly glucose solution, will sometimes bring these patients out of their acidosis, when with proper handling of the underlying condition they may be brought back to normal.

Prognosis.—It is true that a very large percentage of infant mortality is due to diarrhea, but, on the other hand, it is a condition from which practically every baby suffers at one time or another. The cases which prove fatal are usually those which occur in very small or debilitated children, or in children who have a succession of attacks, hardly recovering from one before being overtaken by another. Institutional babies, particularly if there is overcrowding, show an exceptionally high mortality.

Treatment.—At the onset of an attack of diarrhea it is usually wise to clear out the intestinal tract. With young children this is best done by giving a large enema, while with older children a mild saline cathartic such as citrate of magnesia is to be recommended. The use of castor oil or calomel in these cases leads to much unnecessary discomfort and should be discouraged. The child's lack of appetite during the first twenty-four hours should be respected and nothing but water given. If there is much vomiting the stomach may be washed once or twice during this period, and a small quantity of water left in the stomach. Feeding is the important factor in all these cases and requires much care. Very mild attacks sometimes clear up on boiled skimmed milk diluted according to the age of the patient, but in the great majority of cases sweet milk is badly borne and must be replaced by some form of fermented milk. The choice here is fairly large, and includes buttermilk, protein milk, reënforced protein milk, lactic acid milk, and various combinations and modifications of these. In addition older infants may be given curd, made by drying junket. The characteristic of all these foods is that they are

relatively low in carbohydrates and high in proteins. On such a diet a child may hold his weight, but will seldom gain. In consequence, as soon as the nature of the stools has sufficiently improved, an attempt should be made to add carbohydrates to the diet. Dextrimaltose is usually the safest form in which to start carbohydrates, and may be added to the diet in increasing amounts, if well tolerated, beginning with a quarter of an ounce to the day's feeding. The care of cases in which there is much vomiting is particularly difficult. In these a long feeding interval with very small amounts of food should be tried at first. If vomiting continues it may be necessary to feed by gavage, first washing out the stomach. Where there is marked loss of fluid from the tissues, some means must be taken to replace this loss. There are several methods at one's disposal. the choice depending on the particular features of the case. Nasal drip, intraperitoneal and intravenous injections are usually the most valuable. One should not hesitate to give two or three hundred cubic centimeters of normal saline or glucose solution each day over a considerable period, if the patient seems to be benefited thereby. The return to sweet milk and a general diet must be made with caution and at the first evidence of indigestion one should go back to the protein diet. Convalescence is often hastened by a change of climate. A fairly dry locality where the nights are cool is advantageous. Relapses are common, and a child who has suffered a severe attack should, if possible, be removed from a hot climate for the following summer. During the period of convalescence the patient may be benefited by the administration of some form of iron, to combat the anemia which is almost always present, and cod-liver oil as a general tonic.

PROLONGED INDIGESTION

This is a fairly common disease condition of early childhood, characterized by failure to gain, underdeveloped extremities, a large abdomen, and an irritable disposition.

Etiology.—The disease is most common during the second, third and fourth years. It occurs most commonly in children who have been on a diet containing a high proportion of fats and carbohydrates, although it may develop in carefully fed children whose digestion is inherently weak or has been damaged by attacks of acute indigestion or dysentery. It is much more common in bright precocious children than in the more phlegmatic.

Symptoms.—These children are usually brought to the physician because they do not gain in weight, and because their arms and legs look thin and puny. Examination shows in addition a large gas-filled abdomen. The appetite is usually poor, although the patient may have a peculiar fondness for the foods which for him are specially harmful, such as mashed potatoes and cereals. The bowels usually alternate between constipation and diarrhea; in either case the stools are offensive, gray or clay-colored, and contain much mucus. Much gas is passed per rectum. It is characteristic of the disease that the abdomen is considerably larger in the evening than in the morning, due to the accumulation of gas. These children are fretful, contrary and generally hard to manage. They tire easily of any occupation, physical or mental. But they are bright, clever, and affectionate in spite of their handicap.

Prognosis.—The outlook in these cases is for an illness of many months, with but very slow improvement and many relapses. Most of the patients ultimately recover although it is doubtful if the intestinal tract ever is as strong as it should be.

Treatment.—Absolute coöperation between the family and the physician is necessary if anything is to be accomplished in these cases. Neglecting the dietary regulations for one day may undo what weeks of careful feeding have accomplished. Often these patients improve only when separated from the family entirely and placed in the hands of a competent and conscientious nurse. Treatment consists in a diet low in

carbohydrates and fats, and consequently high in proteins. Such a diet is unattractive to the child, and great strength of character is necessary to hold him to it. Buttermilk or protein milk, junket made from skimmed milk, lean beef, broth from beef or lamb, and an occasional piece of dry toast from stale bread form the basis of the diet for the first weeks. If there is much gas or troublesome constination, enemas are of value. but every effort must be made to so regulate the bowels that they move twice daily without assistance. Massage of the abdomen is often of value in this regard. As the nature of the stools improves and the amount of gas diminishes, carbohydrates in the form of well-cooked cereals may be added; then eggs may next be given. Green vegetables and stewed fruits may then be tried. Sweet milk and any form of sugar should be withheld for a long time. The daily life of the child must be carefully regulated so as to provide sufficient periods of rest and avoid fatiguing play.

CYCLIC VOMITING

Cyclic or recurrent vomiting is a metabolic disease of child-hood, characterized by vomiting attacks of several days' duration, occurring at frequent intervals.

Etiology.—The disease is most prevalent from the third to the twelfth year. Girls are more frequently attacked than boys. It is usually found in the children of highly neurotic parents. It seems to be due to an inability of the body to balance properly the amount of sugar in the body tissues. At any rate, this sugar is found to be surprisingly low just before and during an attack.

Symptoms.—The individual attacks frequently come on when no assignable cause can be found, although there may be some slight indisposition such as a cold in the head or fatigue from a children's party to inaugurate the attack. The child for a few hours may be droopy and show dark circles

under the eyes. Vomiting then commences, the vomitus at first being food, later thick, ropy mucus, often bile-stained. The vomitus is frequently blood-streaked, and in severe cases is occasionally fecal. With the vomiting the child becomes prostrated, the pulse becomes weak. There is usually constipation and the urine is scanty. The patient may complain bitterly of thirst, but as each attempt to drink causes a violent vomiting attack the patient often refuses anything by mouth. In three or four days the vomiting ceases, small amounts of food are taken without discomfort, and a surprisingly rapid return to health is made.

Prognosis.—Very few of these children die, although many of them seem on the verge of death during each attack. As puberty is approached, the attacks as a rule become less severe and finally disappear entirely. They are apt to give place in adult life to headaches.

Treatment.—Between attacks these children should be carefully guarded from fatigue and excitement. Special care should be taken that their diet be rather low in fats but otherwise well balanced. If premonitory symptoms develop, it is well to put the child to bed and give an enema. Glucose solution should then be given by Murphy drip in as large amounts as the child will retain. In this way attacks may sometimes be aborted. Once the vomiting has begun, no attempt should be made to give food or drink by mouth. Fluids, either glucose solution, bicarbonate of soda or normal saline, should be introduced per rectum, intraperitoneally or subcutaneously. The comfort of the child depends very largely on the amount of fluids which can be introduced by these means. Morphin is sometimes necessary on the third and fourth days if there is marked restlessness.

PYLORIC STENOSIS

This is a disease of infancy in which the muscle fibers which normally constrict the passage from the stomach into the small

intestine are for some reason much overdeveloped and prevent to a large extent the passage of food from the stomach.

Etiology.—The disease usually begins during the first three months of life. It is much more common in boys than in girls.

Symptoms.—Vomiting is the most marked symptom of the disease. This may come on at any time after the ingestion of food. It is usually projectile in character, the vomitus being forcefully expelled sometimes to quite a distance. Food may remain a long time in the stomach as can be shown by lavage when no food has been given for many hours. The muscles of the stomach are increased in strength by their efforts to force food through the pylorus, and the contractions of the stomach can be watched through the thin abdominal wall, moving as waves from left to right across the upper part of the abdomen. As little food reaches the intestines there is severe constipation and scant urination. Loss of weight is always marked in cases which have persisted for any length of time.

Prognosis.—The disease is always a serious one, usually requiring an operation in the more pronounced cases.

Treatment.—In cases seen early, careful feeding with small amounts of breast milk at long intervals should be tried. In cases where breast milk is not available, reënforced protein milk sometimes gives excellent results. If vomiting persists, the stomach should be washed at feeding time, to remove the residue from the preceding meal, and the new feeding given by tube. If this treatment results in improvement, no operation is necessary; if, however, the patient continues to go down hill, he should be operated upon before his condition gets too poor to withstand the operation. The surgical procedure consists in cutting the constricting muscle fibers of the pylorus without cutting through the mucous membrane lining the stomach or intestines. As soon as the patient has reacted from the anesthetic, feeding with small quantities of breast milk may be started. While the mortality from the operation itself is high, due to the debilitated condition of many of the patients

at the time of operation, those who survive the operation itself usually make a rapid return to normal.

INTUSSUSCEPTION

This is a relatively rare condition of infancy and early childhood. Its importance lies in the fact that the life of the patient may depend upon its prompt recognition. The lesion consists in the slipping of one portion of the intestine into an adjacent portion; the enveloping band of intestine then clamps down, causing obstruction and frequently gangrene of the constricted portion.

Symptoms.—Pain is an early and prominent symptom. It is usually intermittent, colicky, and of great severity. Vomiting is also severe. The first few stools after the onset may be fecal but afterward they contain little but mucus and blood. The blood is bright red, and may be passed in large quantities. Prostration comes on early and is extreme. As a rule the abdomen is soft, and through the wall can be felt a sausage-shaped mass caused by the intussusception. Without operation the patient usually goes down hill rapidly and dies in a few days.

Treatment.—This is entirely surgical, and consists in slipping the outer, constricting portion of the intestine back from the constricted portion. When the condition has existed for some time, and gangrene of the inner portion of bowel has set in, it is necessary to remove the gangrenous portion of bowel entirely, sewing together healthy intestine above and below the removed portion. In any case the operation is a very serious one and the mortality high.

OTHER CAUSES OF VOMITING

In addition to those conditions already mentioned, there are many others in which vomiting is a prominent symptom. Many of these conditions are discussed at length elsewhere, but in order to bring them together the various types are here given in table form:

Vomiting

Type	Time	Nature of Vomitus	Remarks
Overfilled stomach	After feeding	Unchanged food	Commonly called regurgitation, effort-less
Too frequent feedings After feeding	After feeding	Often contains partially digested food from former feeding	Often contains partially Frequently associated with colic digested food from former feeding
Too rich diet	Between feedings	Rancid if high in fat, sour if high in sugar; contains mucus if long continued	Between feedings Rancid if high in fat, If continued, leads to acute indigestion sour if high in sugar; contains mucus if long continued
Acute indigestion	Any time	Food, later mucus, bile	Usually associated with diarrhea, nausea marked
Ruminating	After feeding	Unchanged or partially digested food	Unchanged or partially Preceded by a peculiar working of digested food lower jaw, may be checked by restraining chin with bandages

Voluntary	Before school	Unchanged food	Frequent in neuropathic girls at 8:30 A.M. when they want to stay home from school
Reflex	Any time	Partly digested food or gastric juice	Partly digested food or Caused by finger in pharynx, adenoids, etc.
Whooping-cough	Any time	Food	Follows severe paroxysms of coughing
Pyloric stenosis	After feeding	Food	Vomiting forceful, projectile, associated with gastric waves
Cyclic vomiting	Any time	Food, gastric juice, bile	Attacks come on every few months, last several days; disappear at puberty
Onset of acute infections Any time	Any time	Undigested food	Common in scarlet fever, pneumonia, tonsillitis, etc.
Acute intestinal condi- Any time tions	Any time	Food, mucus, bile, may be fecal	Food, mucus, bile, may Common with appendicitis, peritonitis, be fecal intussusception, etc.
Other toxic or nervous Any time conditions	Any time	Food, gastric juice, bile	Food, gastric juice, bile Common with uremia, meningitis, brain tumor, etc.; often projectile



CHAPTER XIII INFECTIOUS DISEASES



CHAPTER XIII

INFECTIOUS DISEASES

ISOLATION

ONE of the most important phases of the care of communicable diseases is their isolation. By this is meant the shutting off as far as possible of all avenues by which the disease may be transmitted to others. If we knew exactly how each disease was conveyed from one person to another, isolation could be made more definite and probably simpler than we can now make it. Furthermore, if germs were large enough to be seen with the naked eye it would be relatively easy to prevent their spread. But such is not the case. We know some of the ways in which diseases may be communicated, but we cannot say that these are the only ways. We do not even know the nature of the agents which cause some of the diseases to say nothing of seeing them. And so in isolating a patient we must try to think of every possible way in which the disease might be spread, and then prevent its transmission in those ways. When we come down to the application of isolation in a particular case of an infectious disease we find that, while the physician in charge outlines the measures to be taken, it is the nurse who carries them out. So she must be thoroughly familiar with these methods.

The Patient's Room.—The patient should have a room to himself. It should be light and well ventilated and screened against insects. If possible it should have a bathroom available not used by others. The room should contain no draperies or rugs or upholstered furniture.

The Nurse.—The nurse should wear cap, gown and mask so that she may be as completely covered as possible. Rubber gloves are essential where there are dressings to be done or treatments to be given in cases where there are purulent discharges. These gloves should be removed and kept in a disinfectant solution when not in use. On removing cap, gown, or mask it must be remembered that the outer surface of these articles is contaminated, so that this surface must not come in contact with the uniform. On leaving the room the hands and face must be thoroughly washed with hot water and soap. The nurse should, of course, not eat in the sick room and should be very careful about touching soiled hands to mouth or eyes.

The Doctor.—The same precautions apply to the doctor as to the nurse, only to a greater degree, as he must frequently go directly from this patient to another.

Food and Dishes.—All dishes used by the patient should be kept for him alone, and should be thoroughly boiled before being returned to the general supply. Food remnants should be burned or otherwise disinfected.

Sputum and **Excreta**.—Any discharges from the body may be dangerous, and so should receive special care. Sputum, and discharges from the eyes, ears, nose and glands should be caught on gauze, placed in paper bags provided for that purpose and burned. In some diseases, as, for example, typhoid fever, the urine and feces must be thoroughly mixed with some strong antiseptic before being disposed of. Diapers of infants with dysentery should also receive special care.

Linens.—All gowns worn by the patient, nurse and doctor and all bed linen should be soaked in some antiseptic solution before being removed from the room, and should be boiled before being sent to the laundry.

Books and Toys.—It is safest to give the patient only those playthings which one is willing to destroy at the termination of the illness. Books in particular have been known to harbor

disease germs for a long time, and so should not be allowed to go from the sick room to other children.

Release from Isolation.—When the patient is to be released from isolation he should be given a thorough soap and water bath and shampoo. He should then be dressed in clean clothes which have not been in the sick room.

The bed linens should be placed in disinfectant solution and then boiled. The mattress may be brushed off with a whisk broom dipped in some antiseptic solution, and should then be sterilized by steam, or placed out-of-doors in the sunshine for a few days. The bedstead and furniture should be wiped with some sanitary fluid. The floors and woodwork should be scrubbed with soap and water, and the walls dusted with cloths moistened with some antiseptic. Furthermore the room should be thoroughly aired and as much sunlight as possible admitted.

After scarlet fever, if one is to be perfectly safe, the woodwork should be repainted, the floors varnished, and the walls scraped and papered.

Fumigation is still practiced in some cities after contagious diseases, but probably has no advantage over a thorough cleaning. On no account should it be allowed to take the place of soap and water and fresh air. If used it should be in addition to these.

SCARLET FEVER

Synonym.—Scarlatina.

Etiology.—It is not known what germ or virus is the responsible factor in producing the disease. We do know, however, that it may be transmitted to a healthy person in three ways: (1) by direct contact with a sick person or carrier; (2) by means of clothing, toys, books, etc., which have been used by the patient; (3) by contaminated milk. Infants under two years are seldom affected, while children from five to ten years are most susceptible. Above ten years the number of cases rapidly diminishes.

Incubation Period.—This is from one to seven days, usually two or three.

Symptoms.—The onset is usually abrupt with vomiting, pains in the head and back, and sore-throat. The temperature rises rapidly and the patient becomes drowsy and willing to

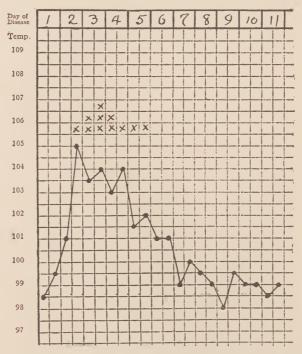


Fig. 14.—Temperature Chart of Scarlet Fever. Rash is indicated by X.

stay in bed. The rash from which the disease gets its name is generally noticed in from twenty-four to forty-eight hours after the onset. It appears first about the neck and spreads rapidly over the trunk and extremities. The color varies from a pale pink blush to the deep scarlet of a boiled lobster. The rash consists of minute, red elevations corresponding to the papillæ of the skin, set upon a slightly less red background. The face does not show the rash, although the cheeks are

very flushed. Around the nose and mouth there is a pale zone which is striking and characteristic. The rash disappears on pressure, to return again in a few seconds. Usually at the end of three or four days the rash begins to fade, and in a week or ten days from the onset of the disease desquamation begins. This peeling process takes several weeks. It consists of shedding the outer horny layers of the skin which have been killed by the eruption. Sometimes the skin comes off in small flakes, sometimes in large patches or strips.

At the time when the papillæ of the skin becomes swollen, those of the tongue swell also, and these red swellings pushing up through the heavy white coat which forms on the tongue produce the picture known as "strawberry tongue" which is characteristic of the disease.

Complications.—Otitis media is the most common complication and is one which sometimes leads to deafness. As it is frequently painless, the physician should make examination of the ears part of his regular routine so that the condition, if present, may be treated early. Adenitis, or swelling of the glands of the neck, is also frequent. Occasionally the glands go on to suppuration. Nephritis should always be watched for by making regular examinations of the urine.

Prognosis.—Probably 90 per cent of all cases of scarlet fever recover. The outlook in a particular case depends on the age of the patient, the severity of his infection, and whether or not complications develop.

Treatment.—The first and most important thing to keep in mind is the complete isolation of the patient. This depends almost entirely upon the nurse, for, while the physician outlines the measures to be taken, it is the nurse who is constantly on hand to see that his orders are carried out.

The patient should be in bed on a liquid diet until the fever has subsided, then the food should be gradually increased till by the third week, if no complications have set in, he is on his full diet

Fever requires treatment only if it continues high, in which case it is best combated by cool sponges every three or four hours, or cold packs repeated three or four times daily. Cold compresses or an ice-cap to the head are also useful, particularly when the patient is nervous and restless.

The sore-throat should be treated by gargling or spraying with some mild solution such as Dobell's. Care should be taken to keep the mouth and nose clean.

Quarantine.—In uncomplicated cases the patient should be isolated for from three to five weeks, depending upon the local health regulations. He should, however, not be released from quarantine as long as there is any discharge from the ears or as long as there are discharging glands.

MEASLES

Synonyms.—Rubeola, Morbilli.

Etiology.—The organism responsible for measles is unknown. This is particularly interesting when we realize that measles is one of the most widespread of all diseases, and one of the most contagious. The infecting element is contained in the secretions of the nose and throat, and is spread by sneezing and coughing during the early stages of the disease. It cannot be carried by a third person. Epidemics occur most frequently in winter and spring, although the disease is seen at all seasons. In countries like ours where there is much travel, measles is kept in circulation and most individuals are exposed and acquire the disease during childhood. As one attack usually protects against further attacks, we seldom see the disease in adults. In isolated communities, however, as in some islands, the disease may be absent for long periods, till whole generations of unprotected individuals have grown up. When measles is introduced into such communities, it attacks all ages and sometimes acquires alarming proportions. Nursing infants are rarely attacked if the mother has had

the disease. In fact, measles before the sixth month is a most unusual occurrence. This, of course, is an argument in favor of maternal nursing.

Incubation.—Eleven to fourteen days usually elapse from exposure to the onset of the first symptoms.

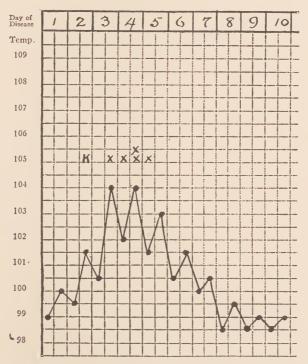


Fig. 15.—Temperature Chart of Measles. Rash is indicated by X, Koplik spots by K.

Symptoms.—The onset of measles is usually gradual. There is running at the nose, some sneezing and cough, and congestion of the eyes. The child appears to have a cold in the head. Gradually these symptoms increase in severity, the cough in particular becoming dry and harsh. The child frequently is drowsy. There may be some fever. Usually on the third or fourth day the temperature becomes higher and a

rash is noticed behind the ears and along the edge of the hair. This rash consists of dark reddish-brown spots, sometimes slightly raised and irregular in outline. The individual spots vary up to about an eighth of an inch in size, and are often more or less crescent-shaped. While they may be thickly scattered, they seldom run together. The skin is frequently swollen, particularly about the face, so that the child has a puffy look. The rash spreads downward to the face, neck, trunk, and finally to the extremities. By the third day it is usually at its worst on the face and is just showing on the hands and feet. At this point all the symptoms, fever, cough, drowsiness, and itching are at their height. They subside rapidly as the rash fades from the face. In addition to these readily recognized symptoms, there is one sign which is very helpful in making a definite diagnosis of measles. This consists in a peculiar eruption seen on the mucous membranes of the cheeks. known as "Koplik's spots." These are bluish white dots about the size of a pinhead and surrounded by a bright red halo. As they usually occur a day or more before the skin rash, they are a great help in early diagnosis.

Complications.—Measles in previously healthy children of three years or over is not a serious disease, but in younger children, particularly in emaciated or sickly infants, it is so frequently followed by serious complications that it is never to be regarded lightly. Particularly is this so in institutions for young children, where the mortality from measles is sometimes very high.

Bronchopneumonia is to be suspected in any case of measles in which the temperature and cough continue after the usual time of subsidence. It is more common in the winter months. In summer the most dreaded complications involve the digestive tract, acute indigestion being particularly common. Otitis media occurs so frequently that the ears should be examined in every case. Some inflammation of the mucous membranes of the mouth is always present, but in puny infants and those

poorly cared for this condition frequently goes on to deep ulcerations of mouth or cheeks which may prove fatal. Measles so often lights up a latent tuberculosis that any child who is suspected of having been touched by this disease should be watched with special care, both during the disease and during convalescence.

Treatment.—As soon as measles is suspected, the patient should be strictly isolated from all other children. Particularly is this true in institutions, where, during an epidemic, the first appearance of fever, snuffles, cough, or running eyes should be a signal for isolation.

Young or delicate children who are known to be exposed should be given an injection of immune serum where such is available. Inmune serum is obtained by taking blood from a healthy person recently recovered from measles and centrifugalizing it, in this way separating the cells from the serum. This serum is given hypodermically, the amount varying with the age of the child. Aside from the use of this immune serum there is no specific treatment for the disease.

The child with measles should be kept in bed in a large, well-ventilated room. He should, however, be out of drafts, and sudden changes in room temperature should be avoided. While the child should be shielded from bright light, it is a mistake except in the presence of unusual eye complications to darken the room. There is usually loss of appetite during the first few days and it is well to limit the nourishment to liquids or semi-liquids. As the appetite returns, soft foods may gradually be given.

Especial care should be taken of the mucous membranes. The eyes should be bathed frequently with cold boric acid solution, and the lids rimmed occasionally with vaselin to prevent sticking. While it is unnecessary to forbid the child all use of the eyes, fine work such as reading or sewing should be prohibited not only during the height of the disease, but also during convalescence. A few drops of liquid albolene in the

nostrils often makes breathing easier, particularly in those cases where there is an excess of adenoid tissue. The mouth should be thoroughly but carefully cleansed after taking food, with some mildly antiseptic solution such as Dobell's. The cough is usually very annoying and may require the use of a simple cough syrup such as Brown Mixture; occasionally a sedative is needed in addition, codein or paregoric being useful.

During the height of the disease the child may have a warm sponge bath daily. If there is much itching, bicarbonate of soda sponges may be given. When the lesions are disappearing, the skin becomes dry, and many children are made more comfortable by a rub with cocoa butter.

The treatment of the various complications, such as bronchopneumonia and otitis media, is the same as when these diseases occur independently of measles, and is considered elsewhere.

Quarantine.—The patient should remain isolated for ten days from the date of the appearance of the rash. If there are complications such as otitis media or ulcerations of the mouth, the quarantine period must be continued till the patient is completely recovered, as the discharges from the mucous membranes may in these cases convey the disease.

RUBELLA

Synonym.—German Measles.

Diagnosis.—This is a disease of much more interest to the physician than to the nurse. It presents unusual difficulties of diagnosis, being frequently confused during the first few hours with measles on the one hand and scarlet fever on the other. As a rule, by the time a definite diagnosis is made, the child is well on the road to recovery, so that, while it may cause the physician some little concern, it seldom brings the patient to the condition where a nurse is thought necessary.

Etiology.—The etiology is unknown. It is quite contagious, but one attack gives protection.

Incubation Period.—This is from two to three weeks.

Symptoms.—The patient may show a slight drowsiness and some coryza before the rash develops, but as a rule the first evidence of disease is the appearance of the rash. This consists of indistinct papules of a rosy red color. They appear first on the face, where they often run together, giving an even red blush to the face. Over the body and extremities the spots usually remain separate, with areas of normal skin between. The individual spots resemble closely those of measles, though they are slightly brighter in color. In fact the color is much more nearly that of a scarlet fever rash, and when the spots are very numerous, so that they run together, the rash is strikingly like that of scarlet fever. Usually the rash disappears in from two to four days. It may itch intensely.

With the appearance of the rash, there is usually some enlargement of the superficial lymph glands, those just behind the ears being especially noticeable and affording a sign of some diagnostic importance. There is little or no sore-throat and no cough. The temperature as a rule is low, seldom going over 100° F., and disappearing as the rash subsides.

Complications.—There are none.

Treatment.—The child should be kept in bed and isolated until the diagnosis is made. By that time he is usually well enough to be up. If there is much itching, a soda bicarbonate sponge or an oil rub sometimes gives relief. Further than this there is no treatment.

Quarantine.—The patient should be isolated for two weeks.

CHICKENPOX

Synonym.—Varicella.

Etiology.—It is not known what germ or virus is responsible for chickenpox. That this unknown substance is contained in the vesicles is known, however, for the disease may be transmitted by inoculation with their contents. The disease is almost always acquired directly from one suffering from it,

although it may possibly be carried by a third person. It is almost exclusively a disease of childhood as it is very highly contagious and most individuals acquire it early in their school life if they have not had it before. One attack gives immunity.

Incubation Period.—Fourteen to sixteen days.

Symptoms.—Chickenpox is usually a very mild affair. For a few hours before the rash appears there may be slight fever and restlessness, but usually the first intimation the parents have that there is anything wrong is when the rash appears. The rash is very characteristic and is hard to confuse with anything else. The individual lesion starts as a small red spot which grows in size and becomes somewhat elevated. This papule then develops a minute blister at its summit which gradually enlarges till it is about an eighth of an inch in diameter. These vesicles are at first filled with clear fluid and have a pearly appearance. The fluid later becomes gravish, and the center of the vesicle frequently collapses, giving a ringlike appearance. The vesicle at its height is surrounded by a narrow halo of inflamed skin. As the vesicle dries, it forms a brownish crust, which gradually loosens and falls off at the end of ten days or two weeks. Usually the skin below the scab is smooth and normal. Occasionally, however, when the vesicle has become infected, there is left a distinct pit which persists through life. It is interesting that in chickenpox not all of the lesions are of the same age, new ones being formed even as the old ones are drying up. Thus there may be seen at the same time papules, vesicles, and crusts.

The lesions may occur anywhere on the body, even on the mucous membranes, but they are most numerous on the scalp, face, and trunk.

Complications.—These are very rare except in very delicate children, or in cases where the skin is not kept clean and there is much scratching. In this event there may be infection of the lesions with the formation of ulcers or with the development of erysipelas. In healthy children kept reasonably clean

complications almost never develop, and the outlook is absolutely good.

Treatment.—The patient should be strictly isolated from persons who have not had the disease until all the scabs are off. The first day or two, while there is fever, should be spent in bed; after that the child may be up around his room. No general treatment is necessary. Itching may be lessened by the use of carbolic acid, I per cent, in vaselin or of zinc oxid ointment. Lesions which become infected may be treated with ammoniated mercury ointment and protected with sterile gauze.

Every effort should be made to prevent scarring of the face. At the height of the disease, if the child is too young to refrain voluntarily, the hands should be restrained so that scratching is impossible.



CHAPTER XIV INFECTIOUS DISEASES—Continued



CHAPTER XIV

INFECTIOUS DISEASES (Continued)

DIPHTHERIA

Synonym.—Membranous croup.

Etiology.—The disease is caused by the bacillus diphtheriæ, otherwise known as the Klebs-Löffler bacillus after its discoverers. It is most common in the fall and winter months Children from two to ten years of age are most susceptible, although no age is exempt. From time to time widespread epidemics occur, but, in addition, in all large cities there are always a few scattered cases. The incubation period is from one to four days.

Symptoms.—Diphtheria is a disease of many manifestations, but in general there are two groups of symptoms: those due to the local action of the organisms, and those caused by the action on various organs of the body of the toxins generated by the bacteria. The onset is usually gradual with slight sorethroat, some swelling of the glands of the neck, and a little fever. On examining the throat there is found a white or gravish membrane on the tonsils or the back of the pharvnx. This membrane gradually spreads until often both tonsils, the uvula, and back wall of the pharynx are entirely covered. With the increase in the size of the membrane the toxic symptoms become more marked. Prostration increases and the patient becomes obviously ill. In favorable cases the membrane begins to break up and detach from the mucous membranes on about the sixth day. Some cases clear up rapidly with the disappearance of the membrane; in many, however, the toxic symptoms persist after the disappearance of the membrane, the heart particularly feeling the effects of the bacterial poisoning. This is shown by a poor pulse and a dusky hue to lips and finger tips. Many such cases die of exhaustion, some of convulsions.

Complications.—The diphtheria toxins sometimes attack the nerves with resulting paralyses. Of these the most common is paralysis of the soft palate which usually comes on about two weeks after the onset of the disease. It is noticed because on taking food by mouth the child regurgitates it through the nose. Paralysis of the eye muscles and weakness of the extremities often follow. Sometimes the heart is attacked, and for weeks the pulse remains poor, and the child must be closely watched to prevent any exertion whatever. Otitis media occasionally occurs and should always be watched for.

Prognosis.—This depends very largely on now early treatment is started. Cases which receive antitoxin early almost all recover. The younger the patient the worse the outlook, other things being equal. Vomiting, a poor pulse, and paralyses are bad omens.

Prophylaxis.—Diphtheria is such a serious disease and its epidemics reach such alarming proportions that everything possible should be done to protect the individual child from it and to check its spread. This means that all cases of diphtheria should be strictly isolated until repeated cultures of the throat have been found free from diphtheria bacilli. Those in contact with cases, if not themselves immune, should have protective doses of antitoxin. Their nose and throat cultures should be negative before they are allowed to come in contact with other children, as it frequently happens that healthy individuals may harbor the virulent organisms on their mucous membranes. Such persons are called "carriers," and are a danger to those with whom they come in contact. When several cases of diphtheria occur in a home or school, one should always suspect a carrier, and search should be made by taking nose and throat cultures from each individual

The Schick Test.—It is possible to tell whether or not a

person is susceptible to diphtheria. A small amount of diphtheria toxin is injected into the skin of the forearm. If there is natural antitoxin present in the system, this toxin is neutralized and no reaction follows. If, on the other hand, the person has no antitoxin, and is in consequence not immune to diphtheria, the injected toxin poisons the skin, causing a swollen, reddened area to appear in from one to two days which may last for a week or more.

Active Immunisation.—The immunity which is produced by the injection of antitoxin into a healthy person is known as passive immunity. It lasts for but a few weeks. But it is possible to produce a much more lasting immunity by the injection of a mixture of toxin and antitoxin. This is known as active immunization, and is being carried out on a large scale on school children in some of our cities. If it lives up to the expectations of its users, it will largely eliminate diphtheria as an epidemic disease. The idea and its application are simple. To a given group of children, say a class in school, the Schick test is applied. Those who do not react to the test are immune and need no further attention. Those who do react are given the treatment. An accurately determined amount of toxin is all but neutralized with a corresponding amount of antitoxin and is injected subcutaneously. The antitoxin protects the child from the poisonous effect of the toxin, but, strangely enough, the tissues start to work producing antitoxin of their own. The body is thus stimulated by several injections at stated intervals and reacts by forming enough antitoxin to protect the child against diphtheria over a long period. This active immunization is built up rather slowly so that the method is not of value during epidemics. The injections produce few unpleasant symptoms in young children, but with older children and adults the reactions are sometimes severe. Hence it is well to immunize children in their early childhood.

Treatment.—Diphtheria antitoxin is one of the few remedial

agents which have a definite rapid effect on the course of disease. Given early and in appropriate doses it materially shortens the course of the disease and lessens the danger of complications. It is usually given subcutaneously or intramuscularly, but in urgent cases should be given directly into a vein. In addition to this specific treatment the patient requires most careful nursing. Absolute rest should be secured, visitors should be excluded. A liquid diet should be given as long as there is any fever, after which the food may be gradually increased. Special care is necessary to keep the mouth and nose clean. A mild gargle is sometimes indicated.

LARYNGEAL DIPHTHERIA

This condition, while really part of the picture of diphtheria, has not been mentioned in what has gone before because it has many peculiarities not shown by other types. As the name implies, this form of the disease consists in an invasion of the larynx by the diphtheritic membrane. The larynx may become involved in the course of a case of diphtheria which has already been recognized in the pharynx or on the tonsils. On the other hand it may start in the larynx with no membrane whatever visible on the usual inspection of the throat. These cases are difficult to diagnose, and it is these which give the disease its special characteristics described below. Fortunately this type of the disease is much less common than the preceding.

The onset is usually gradual. There is noticed a harsh cough, and the voice slowly becomes hoarse or is lost. Soon breathing becomes difficult until each breath is an effort. The child becomes pale and anxious. There is usually some fever, occasionally the temperature rising to 103° F. The pulse is feeble. If untreated, the symptoms become increasingly more severe till the child finally gives up the struggle for air, becomes stuporous, and dies. In untreated cases the number who survive is small, while with the most energetic treat-

ment the outlook is never sure, particularly in infants under one year, of whom nearly a half die.

The treatment of laryngeal diphtheria is primarily the same as that of diphtheria elsewhere, that is to say antitoxin, given as soon as possible after the onset of the disease. In some cases this is all that is necessary; the hoarseness gradually disappears and the dyspnea never becomes alarming. In many cases, however, and in spite of early and repeated doses of antitoxin, the breathing becomes steadily more difficult. This is shown by the anxiety of the child, by the increasing noise of respiration, by the use of all the muscles of neck and thorax in the attempt to draw enough air into the lungs, and by a drawing in of the soft parts of the chest with each inspiration. Cyanosis may occur as a late sign of distress, but should not be waited for before interfering.

Intubation.—When the larynx becomes so narrowed either by swelling of the mucous membranes or by diphtheritic membrane that there is recession of the soft parts of the chest on inspiration, intubation should be employed. This consists in the introduction into the larynx of a specially constructed tube of hard rubber which keeps the larynx open, and through which the child breathes. The necessary apparatus for the operation consists in an O'Dwyer intubation set: an instrument for introducing the tube, one for extracting the tube, and a set of tubes varied in size depending on the age and size of the child.

Introduction of the Tube.—The child is securely wrapped to prevent struggling and is placed on a table so that the head extends slightly beyond one end. The child's head is firmly held by the nurse who is seated at the end of the table. She can greatly assist the operator by raising or lowering the head so as to bring it into the best possible position for the introduction of the tube. The operator stands at the patient's right. A mouth gag is placed in the child's mouth, well back on the left side, and firmly held. The operator then slips the fore-

finger of the left hand into the child's throat to get his landmarks, and when he is sure of his ground quickly slips the tube, on the introductor, into the larynx. When he is sure the tube is in place, it is steadied with the left forefinger while the introductor is removed. A black silk thread which is attached to the tube on introduction is left in place until it is felt that the



FIG. 16.—INTUBATION. One nurse sits at the end of the table where she can hold the head in any desired position. The other nurse steadies the trunk.

child is breathing satisfactorily through it, and that it is not going to be coughed up. Then the silk is cut, and pulled gently out from its hole in the tube.

When intubation has been successfully accomplished, there is a marked change in the condition of the patient. At first there is a severe attack of coughing brought on by the initiation of the tube. This often results in bringing up mucus or even membrane. When the coughing has subsided, breathing be-

comes easy, the violent efforts of the child subside, and he frequently falls into a comfortable sleep.

A child wearing a tube requires constant watching. Sometimes an attack of coughing brings up the tube which may be expelled or may be swallowed. In such a case the physician should be called at once as it may be necessary to replace the tube. Occasionally the tube becomes blocked with membrane which has become loosened from the larynx, but in this case the child usually saves the situation by coughing up tube and membrane. One should be careful not to place the child in a position which would encourage expulsion of the tube. Thus the child should not be allowed to lie face downward or to hang over the side of the crib.

Feeding of the tube patient is sometimes difficult, as food, particularly liquids, has a tendency to go down the wrong way and cause choking. This can sometimes be overcome by feeding thick foods such as cereals, junkets, or baked custard. Occasionally it is necessary to give fluids by means of a tube passed into the stomach through the nose. Most children, however, soon learn to swallow well with the tube in place.

Extubation.—The tube is usually worn for from three to five days. When the temperature has come to normal, and it is felt that there is a fairly good chance that the child can get along without it, the tube should be removed. In order to avoid vomiting and the aspiration of the vomitus, no food should be given for six hours before extubation, and spasm of the larynx should be lessened as far as possible by the giving of a sedative an hour before operation. The operation itself is very similar to, though somewhat more difficult than, intubation. Patient, nurse, and doctor are in the same positions as before. The prongs of the extractor are introduced into the tube, expanded so as to grasp the inside, and the tube quickly withdrawn. If, as sometimes happens, severe dyspnea returns, the tube is replaced. Sometimes several successive attempts at removal are followed by difficulty. These cases fortunately are rare, the

great majority of children being able to dispense permanently with the tube after a few days' assistance from it.

Tracheotomy.—Before the days of intubation, which is a comparatively recent operation, recourse was had in cases of larvngeal diphtheria to the much more radical procedure of tracheotomy. This consists in making an incision through the skin and fascia just above the thyroid gland, dividing several of the tracheal rings, and inserting a tracheotomy tube through which the child breathes. The tracheotomy tube consists of two curved silver tubes so made that one slips easily into the other, where it is held in place by a small catch. The larger tube has at its outer end a flat silver plate which lies against the neck and is supplied with loops for tapes to hold the tube firmly in place. This operation is still performed where intubation, although tried, proves unsuccessful. A tracheotomy set should always be on hand when an intubation is to be done. When a tracheotomy has been done, the inner tube is removed by the nurse every three or four hours for cleaning. The outer tube is removed daily by the physician for the same purpose. The tube is worn until the larynx has so far recovered that the child can breathe freely in the usual way. The tube is then removed and the wound allowed to heal.

Quarantine.—After all symptoms have disappeared, cultures should be taken from the nose and throat. When such cultures prove negative for diphtheria bacilli on two successive days, the patient may be released from isolation.

WHOOPING-COUGH

Synonym.—Pertussis.

Etiology.—Whooping-cough is highly contagious at all ages. Practically all exposed persons who are not protected by a former attack acquire the disease. The causative organism is thought to be the Bordet-Gengou bacillus, although the proof is not conclusive. At any rate this bacillus is frequently found

in the plugs of mucus which are coughed up during a paroxysm. The infection is spread by droplets from the throat, scattered in coughing, sneezing, or talking. Contact must be fairly close, but it is not necessary that the patient whoop in order to spread the disease. In fact the most dangerous stage from the point of view of the spread of the disease is the catarrhal period before the whoop develops. Epidemics are more common in winter.

Incubation Period.—Usually one to two weeks elapse from the time of exposure to the appearance of the first symptoms.

Symptoms.—Attacks of whooping-cough vary widely in their speed of onset, intensity, and duration. The average case, however, is divided into three more or less distinct stages: the catarrhal, the convulsive, and the convalescent stage.

The catarrhal stage begins like an ordinary cold: there is a cough, some sneezing, and often a slight elevation of temperature for a few nights. After a week or so, instead of getting better, as one would expect with a cold, the cough becomes worse. The coughs, instead of being single, and distributed more or less uniformly through the day, tend to group themselves into coughing spells. The catarrhal stage lasts about three weeks.

The convulsive stage is characterized by the fully developed paroxysm of coughing with its attendant whoop. The child usually feels the attack coming on and runs to a near-by object for support. The coughs are delivered violently and in close succession with no taking in of air till the child can cough no more, then there is a long inspiration which produces the whoop, and coughing commences again. The spell continues until a plug of thick stringy colorless mucus is brought up. Usually with infants and often with older children the attack is followed by vomiting. During the paroxysm the tongue is pushed far out with its edges rolled up to form a trough. The veins of the face and head become congested and the eyes bulge. After the attack the child is exhausted. Such attacks may occur

many times during the day and night. This stage usually lasts for three weeks.

The convalescent period is marked by the subsidence of the cough. This stage usually lasts for three weeks also, but in winter it may drag on indefinitely.

Complications.—It is these which make pertussis justly one of the most dreaded diseases of childhood. Older children usually come through an attack without difficulty, but in infants and young children the incidence of pneumonia and malnutrition is large and gives to whooping cough its high mortality. Pneumonia comes on as a rule when the cough is beginning to subside and the vitality is at its lowest, due to the prolonged strain of coughing, vomiting, and loss of sleep. The outlook in such cases is necessarily grave, though by no means hopeless. Loss of weight during whooping-cough is sometimes very great, for, in addition to vomiting, there is often loss of appetite and diarrhea. For this reason patients with whooping-cough require a most careful regulation of their diets. Hemorrhages due to the violence of coughing are fairly common. Convulsions sometimes occur and make the outlook particularly bad. Hernia is not uncommon, the umbilical type being most frequent.

Prognosis.—Given a healthy child of four years or older, whooping-cough while distressing is not dangerous. On the other hand, in poorly nourished infants below six months, the mortality is probably as high as 40 per cent. The older the child, other things being equal, the better the outlook. In summer the outlook is better than in winter because there is less likelihood of pneumonia.

Treatment.—For the sake of the community the child with whooping-cough must be kept away from others who have not had the disease. This is a difficult matter, as the patient must be outdoors as much as possible. In many cities the board of health supplies each whooping child with a characteristic arm band which is supposed to act as a danger sign to other

children. As most children who are susceptible are too young to know the significance of such a sign, it is at best of slight value, and the parents must keep a careful eye on the patient and his associates.

Fresh air is a big factor in treatment. The patient should be outdoors as much as possible. When inclement weather makes this impossible, he should be indoors in well-aired rooms. When the convalescent period is especially prolonged, particularly if the climate or the season of the year is unfavorable, a change to a warm climate is often of great advantage. A sea voyage sometimes brings prompt relief after a seemingly interminable period of coughing.

Careful feeding is the second requisite, great care being necessary to maintain the nutrition. In some children eating brings on a paroxysm of coughing which in turn induces vomiting. This soon results in a marked loss of weight and weakness which is best combated by refeeding. If a meal is vomited, the child is allowed to rest for fifteen minutes and is fed again.

Drugs are of use principally to insure sleep, although their sedative action is sometimes helpful during the waking hours, when the paroxysms are particularly severe. A combination of antipyrin and sodium bromid has seemed of value when used to lessen the paroxysms, and luminal sodium given at bedtime certainly makes the patient more comfortable.

Vaccines prepared from the Bordet-Gengou bacillus, together with other bacteria often found in association with it, have been much used recently. They have not lived up to expectations and their chief recommendation in their present state of development seems to be that they are harmless.

Quarantine.—The patient should be isolated for six weeks from the beginning of the whoop. Many children following an attack of pertussis whoop occasionally for a year or more with each fresh cold. At such times they cannot give whooping cough to others and need not be isolated.

MUMPS

Synonym.—Epidemic Parotitis.

Etiology.—That mumps is a contagious disease spread by contact, there can be no doubt, but what the organism is which causes it is not known. It is not nearly so contagious as measles, only a small proportion of those exposed developing the disease. Children from four to fourteen years of age are most susceptible, although no age is exempt.

Incubation Period.—This is usually from two to three weeks. Symptoms.—In children mumps is usually a mild disease, with discomfort rather than illness. There may be loss of appetite and slight elevation of temperature for a day before the characteristic swelling is noted. Pain in the parotid region also precedes the swelling as a rule. On the second day a soft swelling, more easily seen than felt, is noticed on one side. This swelling has as its center the lobe of the ear, which is pushed outward from the head. Usually in another day or two the gland on the other side becomes involved. Occasionally the other side may not become involved at all; sometimes it becomes swollen after the first side has entirely subsided.

Chewing and swallowing are usually painful and the mouth is dry. Occasionally acid foods cause pain, which gives rise to the household method of diagnosis of giving the suspect a pickle to eat.

Complications.—These are rare, the disease running a mild course in the majority of cases. At or after puberty the testicles are sometimes involved in boys, causing increased elevation of temperature and severe pain. In girls the ovaries and breasts are occasionally swollen and painful. Other complications such as suppuration of the parotid gland, deafness, nephritis, and meningitis occur but are fortunately very rare.

Treatment.—There is no specific treatment for the disease. The patient should be confined to bed and given a liquid diet. Special care should be taken to keep the mouth clean. A warm

flannel binder covering the swellings sometimes makes the patient more comfortable. Phenacetin or aspirin may be used for more severe pain.

Quarantine.—The patient should be isolated for three weeks from the time the swelling is first noticed.

SMALLPOX

Synonym.—Variola.

Etiology.—Smallpox is an extremely infectious disease among the unvaccinated. Persons of all races and of all ages are subject to it. While scattered cases occur from time to time in large cities, the disease only becomes epidemic when through carelessness or willful disregard of rational precautions a considerable percentage of the population has remained unvaccinated in infancy or has failed to be revaccinated in later life. The disease is transmitted by material from the lesions of one infected. It may be spread by direct contact, or may be carried in clothing or by other objects which have been near the patient. It may also be carried by a third person.

Incubation Period.—This is from ten to eighteen days. Most cases develop on the twelfth day after exposure.

Symptoms.—The onset of the disease is usually sudden. Vomiting is frequent and is often accompanied by severe abdominal pain. There is headache which may be violent; pain across the small of the back is also extreme. In infants and young children, convulsions are usual. The temperature rises rapidly to 104° F. or higher, and remains elevated for the first four days. During this time there is marked drowsiness, sometimes deepening into coma.

The rash which is the most characteristic feature of the disease appears on the third day. It shows first upon the forehead and wrists. It spreads rapidly to the rest of the face. In another day it comes out on the trunk and arms

TABLE OF CONTAGIOUS (HIGHLY INFECTIOUS) DISEASES

Name	Chickenpox (varicella)	Diphtheria	German Measles (rubella)	Measles (rubeola)
Incubation Days	14-16	2-5	14-21	11-14
Onset	Slight fever for 24 hours	Sore-throat, fever	Malaise for few hours	Gradual, coryza
Eruption	Papules, vesicles and scabs at same time	None	spots covering whole body	Red flea-bite like spots appearing on face, 2-4 days af- ter onset, spread- ing over whole body.
Other Symptoms	Slight fever, itching	Membrane, large cervical glands, prostration	larged postauricu-	Fever, cough, drowsiness, itch- ing, Koplik spots
Complica-	Superficial infections	Otitis media, lar- yngeal diphtheria, pneumonia, paral- yses, anemia		Pneumonia, otitis media, diarrhea
Isolation	Till scabs are off	Till 2 successive cultures have been negative	Till positive diagnosis is made	10 days after rash appears

while on the following day it involves the legs. Usually when the rash has spread over the whole body the temperature drops to normal.

The individual lesion goes through numerous stages. It starts as a small red spot, this becomes hard and elevated, presently it contains fluid which later becomes purulent. The pustule in turn dries, leaving a scab at the end of two weeks from the beginning of the rash, loosens and drops off leaving a depressed discolored scar. When the rash is at its height the skin is intensely painful, while during the stage of the separation of the scabs, the itching is almost unbearable. The temperature which falls when the rash is fully developed, often rises again when the pustular stage of the eruption is reached.

Complications.—Secondary infections of the skin, such as furuncles and boils, are common, particularly if the child is allowed to scratch. The eyes are often much inflamed. Laryngitis, bronchitis, and pneumonia often occur at the height of the disease, the latter being a frequent cause of death.

TABLE OF CONTAGIOUS (HIGHLY INFECTIOUS) DISEASES-Continued

Mumps (epidemic parotitis	Scarlet fever (scarlatina)	Smallpox	Whooping-cough (pertussis)
14-21	1-6	10-18	7-14
Slight headache, pain at angle of jaw	Sudden, vomiting	Sudden, vomiting	Gradual, cough
None	Red pin points every- where, except face; desquamation	Papules, vesicles, pustules, scabs, scars	None
Swelling of parotid glands, pain, back- ache, loss of appe- tite	Fever, prostration, sore-throat, enlarged glands	Pain, fever, itching All symptoms in- tense	Paroxysmal cough, vomiting, loss of weight
Involvement of sex glands	Otitis media, cellu- litis, nephritis, strep- tococcus, tonsillitis	Skin infections, eye involvement, pneumonia, etc.	Malnutrition, pneu- monia
2-3 weeks	3-5 weeks	Till scabs are off and skin clean	6-8 weeks

Prognosis.—Among children unprotected by vaccination, about 30 per cent. of those who get the disease die. The younger the child and the more widespread the eruption, the worse the outlook. In those rare cases where vaccinated children acquire the disease, its course is usually very mild, the mortality being about I per cent.

Treatment.—The patient should be isolated as completely as possible. All persons known to have been in contact with the patient who have not recently been successfully vaccinated, should be vaccinated. This applies with special force to the nurse, the doctor, and to any others who must handle the child.

During the first stage of the disease the effort is to relieve as far as possible the headache and backache. To this end cool sponges, and an ice cap to the head are useful, while drugs are often necessary, particularly to insure some rest at night.

When the eruptive stage is reached the nursing becomes very difficult. The patient is covered with painful lesions so that all handling is resented. Later as the lesions become

purulent the greatest care is necessary to prevent infection. Prolonged warm tub baths are useful at this stage. During the itching stage, the skin may be anointed with carbolated vaselin, or may be sprayed with a solution of carbolic acid in glycerine and water. It is frequently necessary to restrain the child's hands to prevent scratching.

Liquids and crushed ice should be given during the first stage, while later cereals and custards may be added.

Quarantine.—The patient must be isolated until all of the scabs are off, and the underlying skin healed.

Vaccination.—Artificial innoculation of a person with the virus of cow-pox is called vaccination. A successful vaccination gives immunity to smallpox for a number of years. All children should be vaccinated during the first year, best during the first six months. They should then be revaccinated on entering school, and every five years thereafter. These later vaccinations seldom take, but should be carried out as a matter of safety.

The left arm at the insertion of the deltoid is the point of choice for vaccination, but in girls, for cosmetic reasons, the leg just above or below the knee is chosen.

The vaccination begins to take on the fourth or fifth day, although it is sometimes delayed till the tenth. A red spot appears in the course of the scratch, this enlarges and soon forms a vesicle filled with grayish fluid. As this begins to dry there is usually some local swelling and redness about it, and the patient may be feverish for a day or so. The glands in the axilla or groin are enlarged and tender at this stage. The reaction soon subsides and a hard crust forms which remains in place for a week or more, finally separating to leave a depressed pink scar. In time this turns white and is the mark of a successful vaccination.

From the time the vesicle appears until the scab has separated the wound should be dressed daily. It may be sponged off with alcohol, powdered with boric acid, and covered with sterile gauze, held in place by narrow adhesive strips.

CHAPTER XV INFECTIOUS DISEASES—Concluded



CHAPTER XV

INFECTIOUS DISEASES (Concluded)

INFLUENZA

Synonym.—Grip.

Etiology.—During the past few years the civilized world has been swept by a series of waves of epidemic influenza. The Pfeiffer bacillus has been named as the causative factor and is frequently found in secretions from the nose and throat of patients suffering with the disease. The malady is highly contagious, spreading with amazing rapidity through a community and being carried readily from one part of the country to another. No age is immune, although in some epidemics children seem less apt to be attacked than in others. The immunity produced by an attack lasts for about a year. Epidemics usually reach their height in winter, but in epidemic years scattered cases are encountered through the other seasons.

Incubation Period.—This is short, seldom being more than a day or two.

Symptoms.—It is probable that, during the last few years, a number of different conditions have been grouped with influenza. Certain it is that no disease except syphilis has as varied manifestations as are credited to influenza. For ease of description the disease is usually separated into different types which may occur separately or may occur together.

The *respiratory type* is characterized by fever, cough, and prostration. There is flushing of the face, particularly about the eyes. The throat is infected, and there may be small hemorrhagic spots on the soft palate and anterior pillars of the tonsils. The cough at first is dry and harsh and often associated with

pain under the sternum. Soon there is free production of mucus which is thick and stringy and may give rise to a cough which is hard to distinguish from that of pertussis. This type when uncomplicated usually lasts for four or five days, although the cough may persist for weeks.

The febrile type usually comes on suddenly with a high fever and nothing except an occasional reddening of the throat to give any clue as to the cause. The temperature may go to 105° or 106° F., and be ushered in by convulsions or vomiting. There is drowsiness and prostration, the patient usually resenting attempts to feed or care for him. The fever usually drops and the child returns to normal in three or four days, although in some cases there may be an intermittent fever for a week or more. The nervous manifestations may be so pronounced as to overshadow all other symptoms. This has led some authors to make a separate group called the nervous type. As these symptoms are due to the high temperature, it would seem that no good purpose is served by thus dividing the febrile type.

The gastro-intestinal type is ushered in with severe vomiting which frequently persists throughout the course of the disease. There is high fever, reaching 104° or 105° F. Frequently there is a severe diarrhea accompanied by abdominal pain. At first there is marked restlessness which gives way as the patient becomes weaker to the quiet of exhaustion. After three or four days the vomiting becomes less, the fever subsides, and with the gradual increase in assimilation the patient recovers.

Complications.—The high mortality credited to influenza during the past few years is due in large part to the complications which are unfortunately so common in the course of the disease. Pneumonia is a frequent and serious complication. It comes on at or soon after the height of the disease. A less serious though frequent complication is a bronchitis which may persist for weeks or months. This sometimes gives rise to an erroneous diagnosis of tuberculosis.

Otitis media is so frequent with influenza that it might almost be classed as a symptom rather than a complication. Cervical adenitis occurs, particularly in those cases in which the upper respiratory tract is much involved. The enlargement is apt to continue for a long time, although it seldom goes to suppuration. With this adenitis there is apt to be a slight afternoon rise in temperature, loss of appetite and weight and marked anemia. A tuberculin test is necessary to differentiate these cases from tuberculous adenitis. Meningitis following influenza is a rapidly fatal complication.

Treatment.—The patient should be strictly isolated, those coming in contact with him wearing gauze masks to prevent infection. He should be in bed and on a liquid or soft diet. The taking of fluids should be encouraged. The bowels should move daily, milk of magnesia or aromatic cascara being used if necessary. Tepid or cool sponges are useful if the temperature is high or there is marked restlessness. Phenacetin or antipyrin are of value to make the patient more comfortable but should be promptly discontinued if there is any sign of pneumonia. Complications should be watched for, particularly the lungs and ears should be frequently examined. Complications should be treated as when occurring independently.

Where several members of one family or several patients in a ward are suffering from the disease, the effort should be made to isolate them as completely as possible, one from the other. In this way the danger of complications is lessened.

Quarantine.—The patient should be isolated for ten days if no complications develop.

MENINGITIS

Meningitis, or inflammation of the brain coverings, may be caused by a number of different organisms. There are, however, two main types: those due to the meningococcus; and the tubercle bacillus, which will be taken up separately.

CEREBROSPINAL MENINGITIS

Synonym.—Epidemic Meningitis.

Etiology.—The meningococcus is found in the spinal fluid of cases in the epidemics which occur every few years. It is also found in isolated cases occurring at times when no epidemic is present. Epidemics usually occur in the winter or early spring. Children up to five years of age are most susceptible. The disease is certainly contagious, although but mildly so.

Symptoms.—The onset of the disease is sudden. The temperature rises quickly, there is vomiting, and headache. Often convulsions occur. The muscles become rigid which leads to a drawing back of the head, arching of the spine, and flexing of the arms and legs. The nervous system is extremely irritable, so that loud noises, bright light or handling cause violent reactions, often even convulsions. There is usually delirium, at least at night. Food is taken poorly, and after a few days there is rapid emaciation. The bowels are usually constipated. Herpes of the lip is common, and hemorrhagic spots scattered over the body occur in some cases. Untreated cases go on in this way becoming progressively more emaciated for weeks. Most of them die, death being due to convulsions, marasmus, or some complicating disease such as pneumonia. The temperature varies irregularly from subnormal to 103° or 104° F. Cases treated energetically from the onset usually show marked improvement in a week and may be convalescent in two weeks.

Treatment.—The treatment of cerebrospinal meningitis with Flexner's serum is one of the triumphs of modern medicine. It has decreased the mortality from about 75 per cent to less than 25 per cent. It has shortened the course of the disease and lessened the amount of permanent damage to the nervous system. The efficacy of the serum depends largely on its early administration so one should be prepared to give it as soon as the diagnosis is made. The serum is given into the

spinal canal by lumbar puncture, so that in suspicious cases one should have the serum ready to give when the initial diagnostic puncture is made, so that, if the spinal fluid is characteristic of meningitis, the serum may be given at once without removing the needle. The usual procedure is to draw off as much cerebrospinal fluid as will flow, usually 20 or 30 c.c., then allow 10 c.c. of the serum to flow in under gravity. One or two treatments should be given each day until the temperature comes to normal. The duration and intensity of treatment is also controlled by bacterial examination of the spinal fluid, persistence of living bacteria calling for continued injections.

The nursing care of these patients is most important and difficult. Feeding must frequently be given by tube, in late cases almost invariably so. The bowels must be carefully watched and kept open by enemas. Distention due to gas or to retention of urine must be watched for. Great care is necessary to avoid local infections. Bed sores and ulcerations about the mouth can only be prevented by the most scrupulous cleanliness.

Drugs such as chloral and the bromids are useful in lessening nervous irritability and producing sleep. Convulsions call for the prompt use of chloroform or the hypodermic administration of morphin.

Quarantine.—The patient should be isolated until well.

TUBERCULOUS MENINGITIS

Etiology.—This form of meningitis which is caused by the tubercle bacillus occurs in children who have a tuberculous process elsewhere. Usually tuberculous glands or joints are present; occasionally it is part of a generalized, miliary infection. It is most common in children under two years, although it may occur at any age.

Symptoms.—Unlike epidemic meningitis, the onset is apt to be gradual. The child becomes fretful and cross and re-

sents handling. He vomits, the vomiting being without relation to the taking of food, and often projectile. If old enough the child frequently complains of headache and dizziness. Often he stumbles when walking. A sharp cry at night without waking is common. In young children with an open fontanel, this is found to be tense and bulging. Older children are apt to show changes in the eyes, which are often crossed, and show a rapid side-to-side motion. As the disease progresses, convulsions become common, the child is drowsy, and there is muscular rigidity with drawing back of the head. Digestive symptoms are usually pronounced, the vomiting and failure to take food producing marked emaciation with a particularly noticeable sinking in of the abdomen. The respirations become irregular, often of the Cheyne-Stokes type. This consists of periods of deep breathing followed by periods of quiet.

After a time the patient's drowsiness increases to coma, and for days he may lie unable to recognize his parents or to take nourishment. He sinks rapidly, and death follows from exhaustion or in convulsions.

Prognosis.—As the diagnosis of tuberculous meningitis is sometimes very difficult, the outlook should always be given guardedly. Once the tubercle bacillus is found in the spinal fluid, however, the outlook is hopeless.

Treatment.—There is no specific treatment for tuberculous meningitis, all that can be done is to make the patient as comfortable as possible.

OTHER FORMS OF MENINGITIS

Other bacteria than those mentioned may cause meningitis, the more common being the pnuemococcus and influenza bacillus. These forms occur as a rule with pneumonia and influenza which aids in their recognition. On lumbar puncture the organisms are found in the spinal fluid and the diagnosis confirmed. There is no specific treatment for any of these types of meningitis, and they are usually rapidly fatal.

INFANTILE PARALYSIS

Synonyms.—Acute Poliomyelitis, Acute Anterior Poliomyelitis.

Etiology.—Poliomyelitis is transmitted by an organism so small that it will pass through the pores of a filter. These little bodies can be grown from the nose of patients with the disease, frequently also from those in contact with the patient, and occasionally from the nose of healthy carriers. In addition to scattered cases, there are widespread epidemics which sweep over the whole country. These epidemics occur in summer, usually being at their height in August. Children up to three years are most frequently attacked, although no age is exempt.

Incubation Period.—This is usually ten days, although it may vary greatly.

Symptoms.—The virus may attack any part of the brain or spinal cord, the location and the degree of paralysis depending upon the point of this attack and its severity. With all of the various types, however, there are found the same general symptoms. The onset is usually sudden with vomiting and occasionally convulsions. The child becomes drowsy and irritable and it is noticed that he has fever. After a few hours he begins to complain of headache, stiff neck, and pains in the arms and legs. The fever subsides after two or three days, and then it is noticed that the child is unable to walk, or that he has lost the use of his arms, or that his facial muscles do not function properly. The paralyses may spread somewhat for a few days, then usually remain stationary for a week or more. Then as a rule there is gradual recovery in some of the affected limbs, which goes on for about six months. At the end of that time what paralysis remains is usually permanent. When certain parts of the central nervous system are attacked, the muscles which control swallowing and breathing are paralyzed. In these cases the patient frequently dies from inability to

breathe. On the other hand, there are many mild cases which have the initial symptoms which may have slight paralyses, and which can be proved by examination of the spinal fluid to be true poliomyelitis, in which complete recovery takes place. Between these two extremes lie the children who survive, but who must go through life with legs or arms withered, drawn out of shape and useless.

Prognosis.—The outlook for life is good except in those cases which involve the vital centers. In paralyzed cases one can always look for some improvement. But in many cases there is permanent and disabling damage to the legs or arms.

Treatment.—The patient should be carefully isolated and all secretions burned. He should be kept as quiet as possible. Deformities are sometimes lessened by putting the legs in plaster casts. Pain in the extremities sometimes calls for the use of drugs such as morphin. After the acute stage is passed, massage and passive motion is to be employed to prevent as far as possible atrophy of the muscles while the process of nerve repair is going on. When the recovery has progressed as far as it will by these means, recourse must be had to surgery to correct still further the paralyses and deformities.

Quarantine.—The patient should be isolated for at least six weeks.

CHAPTER XVI RESPIRATORY DISEASES



CHAPTER XVI

RESPIRATORY DISEASES

ADENOIDS

THE subject of adenoids is an important one for the school nurse and those engaged in public health work among children. Often it is the nurse who recognizes the condition and takes the patient to the physician. When we say that a child has adenoids we mean that the lymphoid tissue normally present in the upper part of the pharynx has become so overgrown as to cause difficulty in breathing, or impairment of hearing or frequent colds.

Etiology.—Adenoids are most common in children from three to ten years, although they may occur in infants and in older children. Children with rickets and fat flabby children are more susceptible than properly fed children. Attacks of cold in the head and measles frequently bring about the enlargement. In consequence they are more apt to be noticed in winter or spring than at other times, because then they are enlarged by frequent colds.

Symptoms.—Obstruction of the pharynx so that nasal breathing is interfered with furnishes the most definite symptoms of adenoids. The child, unable to breathe well through the nose, keeps his mouth open. At night the mouth tends to shut, and the child tosses restlessly in the attempt to get sufficient air. He frequently snores. Deformities of the face and chest result from this obstruction. The nose becomes broad and flattened, the roof of the mouth becomes highly arched and narrow, causing crowding of the teeth with frequently

protrusion of the upper incisors. All of this gives the child a dull and stupid look. It is spoken of as the "adenoid facies." Changes in the chest are equally important. Difficulty in the entrance of air into the lungs when the chest expands results in pulling in of the ribs with each breath. The outcome is a pigeon-breast, a funnel-breast, or a deep groove around the chest corresponding to the attachment of the diaphragm. Adenoids easily become infected, leading to frequent colds which are notable for the large amount of nasal discharge. Otitis media is also a common complication of adenoids, and repeated attacks always indicate the need for their removal.

Treatment.—Medical treatment is merely palliative and should be used only until such time as the adenoids can be removed. Albolene may be used in the nose, 5 to 10 drops in each nostril before meals and at bedtime. In older children the addition of a little camphor and menthol is helpful. A 10 per cent solution of argyrol in glycerin may be used in the nose once or twice a day if there is a purulent discharge.

Removal of the adenoids is the ultimate treatment. This operation is attended with remarkably little discomfort to the patient. Usually he may leave the hospital within a few hours, and inside of three or four days has entirely recovered. Occasionally they return even when skillfully removed and a second operation is necessary.

TONSILS

The function of the tonsils is still an open question. The many deep crypts with which they are studded gives them a large surface area, and it does not seem improbable that this surface acts to gather germs from the pharynx and mouth, thus preventing their further progress. Certainly the tonsils are much exposed to bacterial attacks and frequently become infected. They are the site of infection in scarlet fever and usually in diphtheria. In addition they may show other forms of acute disease, and chronic enlargement.

SEPTIC SORE-THROAT

Synonym.—Streptococcus Tonsillitis.

Etiology.—As the name implies this disease is caused by the streptococcus. It occurs in epidemics which may be milk-borne or may be transmitted from person to person. It is more common in the cold months. It is probable that one attack confers immunity.

Symptoms.—The onset is usually sudden with a chill or, in younger patients, often a convulsion. The patient frequently complains of a sore-throat and there is headache, and soreness of the back and limbs. Usually there is vomiting. The temperature rises quickly to 104° F. or higher, and usually remains elevated for three or four days. On examining the throat, the tonsils are seen to be swollen, deep red, and covered in places with a grayish membrane. Enlargement of the glands of the neck occurs in practically all cases. The appearance of the throat often closely resembles diphtheria, from which it can only be told by cultures. Often there are scattered reddish spots over the body, which, with the throat, give a picture difficult to distinguish from scarlet fever.

Complications.—Otitis media is the most common complication, while peritonitis and involvement of the heart are the serious ones.

Prognosis.—Most cases in previously healthy children do well. Where the disease comes on in the course of another illness, however, complications are more apt to set in, and the patient to do badly.

Treatment.—The patient should be rigidly isolated. He should be kept in bed and given a liquid diet. An ice-cap to the head and an ice-collar about the neck often make the patient more comfortable. The mouth should be carefully cleansed after taking food, and some mild watery spray used in nose and throat. The bowels should be kept open by means of mild laxatives or enemas. Phenacetin or aspirin are of benefit in

lessening the muscle pains and general discomfort. The ears and heart should be closely watched in every case.

FOLLICULAR TONSILLITIS

This is by far the most common form of tonsillitis, and it is one which susceptible individuals may have year after year, even several times a winter.

Etiology.—The disease may occur in children of any age although it is not common before the third year. Children with adenoids and fat flabby children are more susceptible than those of firmer tone. One attack predisposes to another, and as each attack causes some increase in the size of the tonsils, children with large ragged tonsils are particularly subject to the disease. The attacks are much more common in the winter months. Frequently the disease seems to be brought on by constipation or some indiscretion in diet.

Symptoms.—The onset is usually fairly abrupt with chilly sensations and pain in the head and back. Frequently there is vomiting. Older children usually complain of pain on swallowing, while children up to four years often give no evidence of pain in the throat, but complain of "stomach ache," putting the hand over the upper abdomen. The temperature rises rapidly, frequently reaching 104° or 105° F. the first evening. The face is usually quite flushed. It is characteristic of the disease that the temperature is out of all proportion to the degree of prostration, the patient often playing cheerfully in his bed with a temperature over 103° F. Examination shows the reddened and swollen tonsils to be studded with small grayish spots, slightly larger than the head of a pin. These are plugs of pus showing in the mouths of the tonsillar crypts. Often the glands at the angle of the jaw are swollen and tender. The disease usually lasts for four or five days. For the first two days the general pains are quite marked, and the temperature elevated especially in the afternoon. By the fourth

morning the temperature is usually subnormal, although it may rise to 101° F. in the afternoon, and the patient is free from discomfort. Convalescence is usually rapid.

Complications.—Usually recovery is complete and uneventful. In rare cases the disease seems to be a forerunner of rheumatism and endocarditis.

Treatment.—The patient should be in bed. During the first two days the diet should consist largely of fluids, and as much water as possible should be given. If there is constipation or much vomiting an enema should be given. Older children may have the tonsils swabbed with argyrol or some other antiseptic solution, or the tonsils may be sprayed with Dobell's solution. Younger children frequently resist these measures, and one must be content to drop a few drops of argyrol in the nostrils. Many children enjoy an ice-collar, and its use should be limited to children who do like it. The general discomfort is best relieved with phenacetin or antipyrin, while during the height of the fever the patient is frequently made more comfortable by cool cloths to the head and frequent sponging of the face and hands with cool water or water and alcohol.

Hypertrophied Tonsils

As the result of frequent attacks of tonsillitis, many children develop chronically enlarged tonsils. These are of all grades, from those only slightly above the normal to great masses of tissue which meet in the midline and make swallowing all but impossible. Such tonsils are almost always associated with large adenoid growths.

Etiology.—Large tonsils usually result from frequent attacks of tonsillitis. They are found particularly in school children in the lower grades.

Symptoms.—Except in the case of the very much enlarged tonsils which interfere with breathing and swallowing, there are few symptoms due to the enlargement alone. However,

such tonsils are easily infected, and the child may lose much time from school due to repeated attacks of acute tonsillitis. Usually there are enlarged cervical glands associated with the enlarged tonsils.

Treatment.—Medical treatment is of little or no avail in reducing the size of tonsils which have long been enlarged. Surgical treatment which consists in the removal of the tonsils, on the other hand, is frequently overdone. No operation which necessitates giving a child a general anesthetic should ever be entered upon lightly. Unless it is felt that the tonsils are a definite detriment to health, or are a constant danger, as in children who are subject to attacks of rheumatism, they should not be removed.

OTITIS MEDIA

Otitis media, usually translated by the child as "earache," is one of the very common ailments of childhood. It consists in inflammation of the middle ear usually following some disease in the nose or pharynx. It may subside spontaneously or the drum may rupture, permitting mucus or pus to flow out, and causing what is commonly known as a "running ear."

Etiology.—Otitis media is a bacterial disease which may be caused by any one of a number of organisms. As it is usually secondary to some disease of the nose or throat, the offending organism is often that which caused the underlying condition. Cold in the head, influenza, measles, scarlet fever, and pneumonia are the conditions most frequently complicated by otitis. Children who have much adenoid tissue are most frequently attacked. Poorly nourished, sickly children, particularly those in institutions, are particularly apt to have the disease, and in these it may come on without any previous infection of the nose or throat having been noticed.

Symptoms.—Earache, fever, and deafness frequently make the diagnosis in older children perfectly evident. In infants, however, otitis media is a frequent cause of obscure and even

alarming symptoms. Children over two years of age usually localize the pain definitely, frequently holding the hand to the ear and resenting any attempt to examine it. In cases of scarlet fever, involvement of the ear may cause no pain and so may be overlooked unless the ears are regularly examined. Infants, on the other hand, seldom localize their pain correctly, frequently putting the fingers in the mouth, or pulling at the hair at the base of the skull.

Fever is practically always present, and may go as high as 104° or 105° F. It usually varies widely and may continue for days. If the drum ruptures or is incised, both the pain and the temperature subside rapidly. Deafness is usually present to a greater or less degree, but except in cases following scarlet fever it is seldom permanent.

In addition to these obvious symptoms, one may see changes in the ear drum with an otoscope. Often there is redness about the edge of the drum which spreads over the surface as the condition becomes worse. Then, as mucus or pus collects in the middle ear, the drum can be seen to bulge from the pressure. Finally if the drum breaks the canal is seen to be full of discharge and, when this is swabbed out, pus may be seen throbbing through an opening of the drum.

Complications.—Mastoiditis, even though it is the most frequent complication, is still quite uncommon. Other complications such as meningitis are very rare.

Treatment.—In the milder cases a few drops of carbolated glycerin 10 per cent dropped warm into the ear will frequently give relief. Where the pain persists, and there is bulging of the drum or tenderness over the mastoid region, medical measures are insufficient and the drum should be incised. This operation is occasionally performed under a general anesthetic, but as the patient is usually suffering from a respiratory infection a local anesthetic, such as cocain 4 per cent painted over the drum, is safer. The patient should be securely wrapped and firmly held while the physician performs the oper-

ation. Following the incision there is usually a flow of blood or pus from the canal, although in early cases the drum may heal with no discharge. After-treatment consists in keeping the canal clear by syringing. Usually it is sufficient to syringe the ear three times a day, although in cases with much thick purulent discharge more frequent cleansing is necessary. Warm boric acid or bichlorid of mercury, I:10,000, are usually



Fig. 17.—Examination of the Ears. Thus wrapped, and in this position, the child can be firmly held by one nurse.

used. The syringing should be continued until the fluid comes away clear. Usually this requires three or four ounces of fluid. Following the syringing, the outer ear should be carefully dried and anointed with vaselin to protect the skin from maceration. Sometimes, after the canal has been cleansed, stronger antiseptics such as mercurochrome or gentian-violet are dropped into the ear.

Isolation.—Cases of otitis media following scarlet fever or measles should be isolated as long as there is any discharge, as this discharge may spread the disease.

CROUP

Catarrhal spasm of the larynx popularly known as croup is a fairly common disease of childhood. It is not to be confused with membranous croup which is the term sometimes used for diphtheria.

Etiology.—Croup is a disease of young children, to which those of some families only are susceptible. Children with adenoids and large tonsils are particularly apt to be affected. It occurs usually in winter and early spring, particularly in cold weather.

Symptoms.—The child comes in from play in the afternoon with a slight cough and running nose. Toward bedtime the cough becomes harsh and the voice may be hoarse. After a few hours of sleep, the child awakes in great distress. Breathing is difficult, and each inspiration noisy. The voice is usually reduced to a hoarse whisper, and the cough is harsh and metallic. The temperature may be slightly elevated and the pulse is rapid. To one seeing it for the first time the picture is an alarming one, and the terror of the parents is usually reflected by increased excitement on the part of the patient.

The paroxysm usually lasts for two or three hours after which the child goes off to sleep. He wakes in the morning with a harsh cough, but well enough to be up and around. Unless warded off by proper treatment the attack returns on the second and third night.

Treatment.—This divides itself into two parts: treatment of the night attack, and prevention of a repetition on the succeeding nights.

When one has assured himself that the condition is not laryngeal diphtheria, the first thing to do is to reassure and quiet the family. Peaceful surroundings at once produce improvement in the patient. Of all the remedies in vogue for croup, the two which offer the most chance of success are steam inhalations and the production of vomiting. The child should

first be put in a croup tent filled with steam. If this fails to lessen the stridor he should be made to vomit by the use of full doses of syrup of ipecac. For a child of three or four years a teaspoonful may be given every fifteen minutes till the child vomits freely. Vomiting usually relieves the spasm, and the child goes back to sleep. Very rarely all these methods fail, and one must resort to intubation to prevent suffocation.

The second phase of the treatment consists in the prevention of a recurrence. The child should be kept in the house in a comfortably warm room free from drafts. If he is constipated an enema should be given. During the afternoon the patient may receive alternately antipyrin and small doses of syrup of ipecac, one being given each hour. This method used on the second and third days seldom fails to prevent a paroxysm during the night.

Prognosis.—Recovery is rapid and complete, but one attack predisposes to others.

CHAPTER XVII RESPIRATORY DISEASES—Continued



CHAPTER XVII

RESPIRATORY DISEASES (Continued)

BRONCHITIS

Bronchitis is a common disease of infancy and childhood. It occurs in all degrees from mild attacks which last but a few days to serious conditions which can scarcely be told from bronchopneumonia and which persist for weeks. It is to the winter what diarrhea is to the summer.

Etiology.—The disease may come on following exposure to wet and cold, or it may develop as a complication in colds, measles, influenza and other diseases. Certain children seem to have sensitive mucous membranes which make them susceptible to bronchial infections. Rachitic children and those in whom tonsils and adenoids are present are also unusually prone to attacks. Cold wet weather is a frequent inciting factor.

Symptoms.—These depend largely upon the age of the patient and the severity of the attack. In infants there are cough, increased rate of respiration and fever, depending in degree on the nature of the attack. Frequently one can hear and feel the mucus bubbling up and down in the larger tubes. What mucus is coughed up into the pharynx is promptly swallowed. This produces loss of appetite and sometimes vomiting. The mucus is frequently present in large quantities in the stools. When the chest is examined with a stethoscope the mucus can be clearly heard crackling or bubbling in the bronchi. These sounds known as râles are of value in determining the extent and progress of the disease.

In older children there is usually pain over the front of the

chest. The cough is persistent and may be worse at night. At first the cough is harsh and tight, later it becomes loose and productive, and children over six can usually be taught to expectorate. In older children the fever is usually not marked, and subsides after a day or two. The cough may clear up in a week or ten days, or it may drag on till warm weather sets in.

Prognosis.—In infants the disease may be a serious one, frequently merging without any definite changes into broncho-

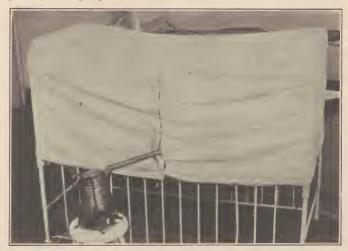


Fig. 18.—Inhalation. A canvas covering fits closely about the crib. Croup kettle is heated by electric hot plate.

pneumonia. Particularly is this true when the disease follows measles or influenza. In older children recovery is usually prompt, although frequent attacks may gradually wear a child down and interfere seriously with his attendance at school.

Treatment.—If there is fever the child should be in bed, at any rate he should be indoors in a warm well-ventilated room, out of drafts. The diet should be light while there is fever or gastro-intestinal symptoms, but care should be taken that the general nutrition of the child suffers as little as possible. Little can be done by local applications although a mustard plaster

to the chest sometimes seems useful in infants. Certainly the popular practice of anointing the child with goose grease or other oily substances and applying layers of flannel cannot be too strongly condemned. Inhalations of steam which may be medicated as with compound tincture of benzoin are of undoubted value, especially in the early stages of the disease when the cough is dry and painful. Cough syrups are often helpful, but it must be remembered that they all affect the appetite unfavorably, so that they must be used sparingly. Paregoric or codein is often needed for the first few nights in order that the patient may get some rest. Adrenalin, administered hypodermically, is necessary in the rare cases in which asthmatic attacks occur in the course of the bronchitis. Children who have rickets as an underlying condition should, of course, receive cod-liver oil. Children who have repeated attacks are so completely incapacitated thereby that every effort should be made to have them spend the winter months in some mild climate.

PNEUMONIA

Classification.—In adult medicine, pneumonias are usually divided under two heads, lobar pneumonia and bronchopneumonia. In the first, as the name suggests, the disease is largely confined to one or sometimes more lobes of the lungs, which lobes are usually attacked in their entirety, while the remaining lobes are clear. In bronchopneumonia, on the other hand, the process is a scattered one, attacking small patches throughout all the lobes. This distinction is based, it can be seen, on the anatomy and pathology of the disease.

Both types of pneumonia are found also in children, but with them it is far better to classify the diseases clinically than pathologically. From this standpoint one separates the cases in which pneumonia is the initial and only disease from those cases in which pneumonia comes on in the course of another disease. The first is spoken of as primary pneumonia, the

other as secondary pneumonia. They are so different in their course and outcome that they deserve to be discussed separately.

PRIMARY PNEUMONIA

Primary pneumonia is that type which comes on suddenly in previously well children.

Etiology.—The disease is usually caused by the pneumococcus, although occasionally the influenza bacillus or other organisms may be responsible. As it is most prevalent in the winter and early spring, exposure to cold and wet seems to play a part in its production. It may attack children of any age, but robust children from two to ten years seem most often affected.

Symptoms.—The onset is usually sudden, with chilly sensations, frequently vomiting, and in infants sometimes convulsions. Within a short time the child is obviously ill and is willing to stay in bed. The breathing, even at this early stage, is characteristic. It is shallow, largely abdominal, and rapid, often reaching 80 a minute. At first, it seems effortless, but later in the course of the disease, particularly if the patient is doing badly, the breathing may become deeper and labored, the whole chest coming into play. As a rule, the nasal openings widen with each breath, this dilatation of the alæ nasi being quite characteristic of the disease. Also with each expiration there is often a quick grunt. Both of these symptoms occasionally occur in children with a high fever from some other cause and so must not by themselves be interpreted as meaning pneumonia. Cough is not a marked symptom, often being entirely absent. When present it is usually unproductive, unlike the abundant rusty, blood-stained sputum of the adult. Pain sometimes is severe, but more often it is moderate or slight. It is usually poorly localized, often being referred to the abdomen. In fact, it is not an unheard of thing for a child with a beginning pneumonia to be operated upon under the impression that he is suffering from appendicitis. The temperature usually rises during the first few hours to 103° F., or more, and frequently continues at that level throughout the disease

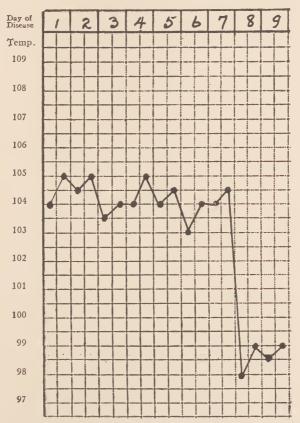


Fig. 19.—Temperature Chart of Primary Pneumonia. Crisis on the eighth day.

In less typical cases it may vary daily through a wide range. The pulse is rapid from the start, often reaching 150 or more per minute. Counting so rapid a pulse is almost impossible for the nurse to do accurately, but fortunately the quality is of more importance than the rate, and even with a rapid pulse

one can determine whether it is full or thready, regular or otherwise. The course of the disease may vary with the child and the attacking organism, but generally after the temperature has been elevated for about a week there comes a sudden change in the patient's appearance. The breathing becomes less rapid and more nearly normal in character, the patient, while still weak, loses his ill look. He feels better and frequently settles himself for the first quiet, natural sleep which he has had in days. This remarkable change is accompanied by a drop in temperature from 103° F. or higher to normal in the space of a few hours. Such a rapid termination of the disease is spoken of as the *crisis*. Usually when the temperature comes down by crisis it stays at or near normal, although occasionally there are rises on two or three succeeding days to 100 or 101° F. In some instances, particularly with younger children, the disease ends by lysis, that is, instead of an abrupt termination, the temperature falls gradually, each day reaching a slightly lower level, until after days or sometimes weeks it reaches normal. Such a termination is more common in secondary pneumonia and is never as favorable as a crisis.

Complications.—Empyema occurs occasionally during or following primary pneumonia. It consists of a collection of pus within the pleural cavity. The treatment is surgical and consists in draining the pus off through an opening in the chest made by removing a section of rib. Following such an operation the wound usually drains for ten days or more and the most careful dressing and nursing is necessary to prevent abscesses and bed sores. Otitis media is a more frequent but far less formidable complication. The comfort of the patient usually require that the drum be incised when this condition is found

Prognosis.—The outlook in a given case depends upon the age of the patient, his general state of health, and the extent of the disease. Children over two years of age recover in the vast majority of cases. Under two the chances are in favor

of the child but decrease the younger he is. Continued high fever and marked nervous symptoms, particularly convulsions, are bad omens.

Treatment.—As yet there is no satisfactory specific treatment for pneumonia, and our energies must be directed toward making the patient comfortable, avoiding complications so far as possible, and treating them should they arise.

The patient should be in a comfortable bed, in a large well-ventilated room, free from drafts. He should be in a loose warm gown, unhampered by heavy or constricting jackets, pads, or poultices. The diet should be largely liquids, and should be offered at regular intervals. Pain in the chest can often be relieved by an ice-bag, although frequently codein or morphin is required. Unless the temperature goes unusually high, no treatment is necessary to bring it down. If a temperature of over 104° F. is associated with marked restlessness or delirium, cool moist cloths to the head or a tepid sponge bath may be quieting. There is seldom any indication for stimulants in these cases. When signs of cardiac or respiratory failure do occur, however, energetic stimulation is indicated. These signs of collapse will be dealt with under Secondary Pneumonia, in which condition they are far more common.

Special care should be taken to keep the mouth clean and the nose free from purulent discharges. The abdomen must be carefully watched, as tympanites by causing pressure upward against the diaphragm embarrasses both heart and lungs. The tympanites may sometimes be relieved by the use of a hot water bag over the abdomen. More often, however, one must resort to a rectal tube. In delirious or stuporous patients the bladder must be carefully watched and if it becomes distended this fact should be brought to the physician's attention. Convalescence is usually rapid and the usual methods of rest and careful feeding are all that are necessary to bring the patient back to complete health and strength.

SECONDARY PNEUMONIA

Etiology.—As the name implies, secondary pneumonia follows some other disease, especially those which involve the respiratory system. It is most common following measles, whooping-cough, influenza, bronchitis and diphtheria, although it may occur in children debilitated by prolonged intestinal upsets. While it attacks children of any age, those under three

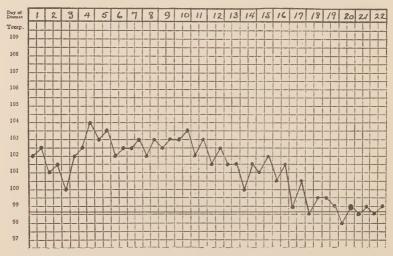


FIG. 20.—TEMPERATURE CHART OF SECONDARY PNEUMONIA FOLLOWING MEASLES. Patient was a boy 16 months old. Temperature fell by lysis.

years of age are most frequently affected. It is especially common and virulent in orphanages and foundling asylums. It is almost always of the widespread or bronchopneumonic type and may be caused by any one of a number of organisms.

Symptoms.—The onset is usually indefinite, merging intimately with the preceding disease. There are no special symptoms of onset as with the primary form. In a child with measles, for example, the looked-for drop in temperature does not occur, and the cough, instead of improving, becomes more

troublesome. After a day or so, definite signs may appear in the chest and one realizes that pneumonia has developed. The

breathing is rapid, frequently 100 to the minute, and is labored. Usually there is dilatation of the alæ nasi. Cough is much more troublesome than in cases of primary pneumonia. Pain is usually not marked. The temperature is usually neither as high nor as constant as in the primary form. Prostration is generally very great and progresses as the disease continues. The course of the disease is very indefinite, sometimes terminating in a few days, more often dragging on for two weeks or more. In favorable cases, the temperature then gradually falls. each day approaching more nearly to

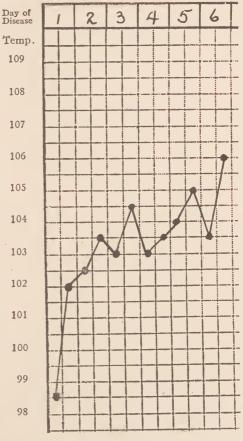


FIG. 21.—TEMPERATURE CHART OF SECONDARY PNEUMONIA FOLLOWING WHOOPING COUGH. This was the same boy whose chart is shown in Fig. 20. At 20 months he developed whooping cough. Two weeks later pneumonia developed. Death on the sixth day.

normal, till after days it finally becomes constant at normal. Relapses are common and all too frequently the temperature will fall for a few days, then there will be an extension of the

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disease and it will go back to the old high level. In many of these protracted cases the patient's strength finally gives out and he dies of exhaustion.

Sometimes even in cases of short duration where the toxemia is very great, the patient may develop signs of collapse of the circulation or of respiration. Sudden weakness, with a rapid irregular pulse, and cold extremities point to cardiac failure. Cyanosis and loud râles in the throat with increased labored respiration indicate respiratory failure. Such changes call for prompt action, and should be reported to the physician at once.

Complications.—Secondary pneumonia has a decided tendency to become chronic, with permanent changes in the lungs which serve as a starting place for fresh attacks with any future exposure. Otitis media is common and should always be watched for. Ulceration of the mouth and sores about the nose and lips will develop unless most careful attention is paid to cleanliness of these parts.

Prognosis.—The outlook in secondary pneumonia is always grave, nearly one half of all the patients succumbing.

Treatment.—Older children should be in bed. Infants are sometimes benefited by the change in position that comes when held in the nurse's arms. As the disease is apt to be of long duration, great care must be taken to maintain the nutrition at the highest possible point. Simple, nourishing food should be given at regular intervals when the patient is strong enough to take it. Liquids must, of course, form the major part of the diet in younger patients.

The cough is sometimes made easier by inhalations, but often some drug such as codein is necessary if the child is to get any rest.

Stimulants are often needed in cases of collapse; of these adrenalin and caffein have the most prompt action, while digitalis is the most useful as a cardiac stimulant over a longer period. Oxygen is sometimes used in cases of cyanosis.

CHAPTER XVIII TUBERCULOSIS AND SYPHILIS



CHAPTER XVIII TUBERCULOSIS AND SYPHILIS

TUBERCULOSIS

Tuberculosis is more widespread and more varied in its manifestations than any other disease. It takes on as many different forms as there are organs in the body.

Etiology.—Two forms of tubercle bacillus are met with in man: the human, and, more rarely, the bovine type. Children acquire the former by association with persons ill with tuberculosis, the latter from the milk of tuberculous cows. Certain diseases make the child particularly susceptible to infection. Thus it frequently follows measles or whooping-cough. Babies are seldom born with the disease, but children of tuberculous parents frequently acquire it at an early age.

The Tuberculin Test.—There are various tests which can be used to show the presence of infection with the tubercle bacillus. Of these the most used with children are the *Pirquet test* and the *intracutaneous test*. In the former, a preparation made from the tubercle bacillus, known as "tuberculin," is applied to a superficial scratch on the skin. In the latter, a measured amount of tuberculin is injected into the skin. In either case a reaction takes place about the site of the test, in the course of from twenty-four to forty-eight hours, in children who have a tuberculous infection. When one of these tests is carried out on large numbers of children a surprisingly large percentage of positive reactions occur, many children who seem perfectly well showing a positive test. This necessitates dividing those who give a positive reaction into two groups,

those who have a tuberculous infection, but no symptoms referable to the disease, and those who have symptoms caused by the disease. The former are said to have a tuberculous infection, the latter have tuberculosis in one of its forms.

Types of Tuberculosis.—In adults the pulmonary form of tuberculosis is by far the most common. In children, on the other hand, gland and bone tuberculosis are more common, while rapidly fatal forms such as miliary tuberculosis and tuberculous meningitis occur much more frequently than they do in adults.

Tuberculosis of the Lymphatic Glands.—The glands of the neck and those at the root of the lung are most frequently enlarged, although any glands may be involved. These are associated with general symptoms such as fever, loss of appetite and loss of weight, and local symptoms due to pressure depending on the position of the glands. Thus enlarged glands around the root of the lungs may cause cough and changes in the voice. Cervical glands are particularly apt to break down and discharge. They differ from glands infected with other organisms in that they show but little tendency to heal, frequently discharging for months or years, and leaving as a rule ugly puckered scars.

Tuberculosis of the Bones and Joints.—Bone and joint tuberculosis are surgical conditions and are mentioned here only as illustrating the varied types of tuberculosis. They are extremely chronic conditions and frequently result in marked deformities.

Miliary Tuberculosis.—In infants and young children tuberculosis sometimes becomes scattered throughout the body. This is known as miliary tuberculosis. At first the only symptoms may be fever, loss of appetite and loss of weight. The fever may not be high, but each afternoon there is an elevation perhaps to 100° or 101° F. The child gradually becomes weak and pale but it may be several weeks before there is anything definite to point to tuberculosis. Usually the first indication

of the nature of the disease comes when the lungs are sufficiently involved to cause a cough, although sometimes meningitis develops, which on examination of the spinal fluid, proves to be tuberculous. The outlook in this form of the disease is very bad.

Pulmonary Tuberculosis.—When the tubercle bacillus attacks the lungs, it may set up a bronchitis or a pneumonia just as other organisms do, and for a time it may be impossible to tell them apart clinically. When the condition persists, however, after it should be clearing up if caused by any other organism, one begins to suspect the real state of affairs. With the help of X-rays and the tuberculin test a definite diagnosis can usually be made. The outlook in pulmonary tuberculosis in children becomes better as the child becomes older. Under two years the prognosis is very bad. At any age prolonged rest in bed is necessary for a cure.

Latent Tuberculosis.—This is by far the largest group of cases, and in many respects the most important. These are the children who, at some time, have become infected with tubercle bacilli, but in whom the infection was so slight or the resistance of the body so good that the infection has been overcome, usually with no recognized symptoms. These are the children who react to tuberculin without having any other signs of the disease, and most of them go through life without ever developing active symptoms. However, any prolonged illness, or any sudden loss of weight, may reduce their resistance to the point where the disease can become active. Measles and whooping-cough are particularly apt to cause a flare-up, and from these diseases this group of children should be most carefully guarded. They should lead an easy, carefree life, with plenty of sleep and rest, good food and fresh air. If they can be kept a few pounds over weight, and away from acute infections, their chances are excellent.

Prophylaxis.—All children should be shielded as far as possible from tuberculosis. This means that they should be kept

away from persons who have the disease in an active form. An infant should not be nursed by its mother if she is tuberculous. The child's nurse should be free from the disease. Rooms where tuberculous persons have lived often become heavily infected, and one should always be careful to ascertain on moving into a new house or apartment that the former occupants were not actively tuberculous. To protect the child from the bovine form of the disease, the milk should be from tuberculin-tested cows or, failing this, it should be thoroughly boiled.

Treatment.—The primary treatment in all forms of tuberculosis is rest. The patient should be in bed until the temperature has stayed constantly at normal for a considerable length of time. Then he should be allowed up gradually, slowly increasing the amount he is allowed to do. On any rise of temperature he should be returned to bed and kept there longer than would be the case with another child. The second requisite is good wholesome food. In older children it is far better to give three meals a day than to run the risk of destroying the appetite or ruining the digestion by trying to feed them between meals. The third item in treatment is fresh air. Wherever possible these children should live in the open, eating and sleeping out of doors. Sunshine is a great tonic, and the child should have as much of it as possible. Drugs are seldom of value but sometimes are necessary to allay pain or give the child rest from a troublesome cough. Injections of tuberculin are used in treating certain forms of the disease, particularly where the eyes are involved. This type of treatment unfortunately has not proven of value in the more widespread cases.

SYPHILIS

Syphilis in childhood is of two forms: the hereditary and the acquired, of which the former is by far the more common. Both are caused by the same organism, the spirochæta pallida.

Acquired Syphilis

Children are usually infected by being kissed by persons having active syphilitic lesions of the lips or mouth. In consequence the primary sore of the disease is usually on the mouth or face. Usually the infection takes place from a parent, more rarely from a nurse maid. Except that it is relatively more mild and responds more readily to treatment, acquired syphilis is similar to the hereditary form.

HEREDITARY SYPHILIS

Etiology.—A woman with active manifestations of syphilis usually transmits the disease to her unborn child. The result varies somewhat with the stage of the disease in the mother. Often there is an abortion in the early stages of pregnancy. Sometimes the infant is born prematurely and soon dies. When the pregnancy is of the usual duration the child may appear in excellent condition at birth and the disease not be recognized till later.

Symptoms.—If born at term the first symptoms are usually noticed when the child is from two to four weeks old. At first there is a coryza with much discharge and the formation of crusts in the nose. Often the discharge is bloody. The crusts give rise to nasal obstruction which causes "snuffles" which are very characteristic of the disease. Associated with the snuffles there is frequently hoarseness. Soon after the snuffles, a rash is seen on the face, arms and legs. This consists in bright red circular spots which later fade out, leaving a brownish stain. Occasionally there is scaling of the palms and soles.

A very characteristic feature of the disease is the sores about the mouth and anus. At the corners of the mouth deep ulcers form which heal slowly, leaving deep scars. These scars contract, giving the mouth a puckered appearance.

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Around the anus there often develop moist elevated patches of a pinkish color which are known as condylomata. These open sores of syphilis may contain the organisms of the disease so that in handling an infant with such lesions the greatest care is necessary to prevent infection.

Changes in the bones and joints occur which are often painful. These occasionally give rise to a faulty diagnosis of paralysis as the child is disinclined to use the painful extremity. The teeth of the second set often give a late evidence of hereditary syphilis. The most significant change is shown in the upper middle incisors. These are peg-shaped, tend to lean toward each other, and have a rounded notch in the lower edge. These are known as Hutchinson's teeth,

Wassermann Reaction.—This is a laboratory test for the detection of syphilis. It may be performed on the blood or on the spinal fluid. To carry out the test a few cubic centimeters of these fluids are needed which may be obtained by inserting a needle into a vein, or by lumbar puncture. In suspected cases, blood may be taken at birth from the umbilical cord before it is tied.

Prognosis.—This depends upon the severity of the infection and whether or not the patient was carried to term. Babies who are in good condition at birth may do well if treated actively from the start. In syphilitic babies born before term the outlook is not good. Acquired syphilis usually does better under treatment than the hereditary form.

Prophylaxis.—Syphilis is so much easier to prevent than to cure that every measure should be taken so that the infant may start life free from the disease. Persons with the disease should, of course, not marry until a prolonged course of treatment has been carried out and the blood has been found to be negative. A syphilitic woman who becomes pregnant or a pregnant woman who becomes syphilitic should be energetically treated. This often is rewarded by the birth of a normal infant at term. Finally every precaution should be

taken to prevent the infection of a normal child by syphilitic parent or nurse. On the other hand, a syphilitic infant should be allowed to nurse from no one but the mother, as a wet nurse may easily become infected from the sores in or about the mouth of a diseased child.

Treatment.—When the diagnosis of syphilis is made, treatment should be at once begun. The usual treatment consists in a series of intravenous injections of salvarsan or one of the later modifications of that drug. Five or six injections are given at intervals of a week. Then there is a rest period and another series is given. The number of courses of injections depends on the progress of the disease and upon the Wassermann reaction which may be taken at the beginning of each course. Between injections some other form of treatment is usually used. With infants this is usually inunctions of mercurial ointment, the so-called "blue ointment." A pea-sized piece of the ointment is placed upon a piece of linen and laid on the abdomen under the band. This moves around as the baby twists and turns, thus effectually rubbing the ointment into the skin. Local sores are usually treated with calomel either as a powder or in an ointment. Special pains must be taken to clear the crusts from the nose and to apply ointment to ulcerated areas. This enables the child to breathe more easily and makes him more comfortable.



CHAPTER XIX DISEASES OF THE SKIN



CHAPTER XIX

DISEASES OF THE SKIN

An infant's skin is very delicate. It is sensitive to irritation and infection from without and to derangements within the body. There are certain children who will develop skin troubles in spite of the most painstaking care, but in the majority of cases a reasonable amount of attention to cleanliness and avoidance of irritation will keep the skin in a healthy condition.

Moisture is irritating to the infant's skin. After his bath he must be dried with care. All the folds of the skin should be given especial attention. It is far better to dry the skin thoroughly than to leave it moist and trust to a coating of powder to absorb the excess moisture. When wet or soiled he must be cleansed, dried and fresh diapers applied. If he is drooling, as all babies do from the third to the sixth month, one must be careful lest the saliva irritate the chin, cheeks and neck. If irritation appears, a little lanolin or cold cream, applied several times a day, will sometimes check it. Likewise cold and raw winds may set up irritation on the face and hands. In children who chap easily the hands should be covered with mittens and a little cold cream applied to the cheeks before taking the child out in cold weather. If this is not sufficient, a veil may be worn.

Where numbers of children are together, as in asylums or schools, the greatest care is necessary to prevent the spread of the common contagious skin diseases, so that a knowledge of these is very essential to the nurse.

ECZEMA

Etiology.—This is the most common skin disease of child-hood. It occurs at any age, although it usually has its beginning during the first six months. Children in certain families have a marked predisposition to eczema and develop it on the slightest provocation. Well-nourished children are more susceptible than poorly nourished. The disease is not contagious and is usually set up by some form of external irritation. Cases which last after the second year usually depend in addition on sensitivity to certain foods, particularly egg. There are many forms of eczema, so that only the most common manifestations can be set down here.

Symptoms.—The disease usually starts on the face. The skin becomes thickened and scaly. Sometimes there is weeping with the formation of brownish crusts. These lesions itch, and if the child is not restrained he will scratch until bleeding takes place. Usually the disease does not confine itself to the face, but after a time spreads to the neck and trunk as well. In consequence of the itching the child is very restless and tosses constantly in his sleep. In older children it is more apt to attack the bend of the elbow and wrist and the back of the knee. In them the nervous reaction is usually not so great.

Complications.—The danger of infection both local and general is the only common source of complications.

Prognosis.—Eczema is a stubborn disease. Most cases occuring in infancy clear up by the time the child is a year and a half old. Before that time the disease can usually be held in check with appropriate treatment but not permanently cured.

Treatment.—The first indication is to remove all sources of outside irritation. Careful inquiry must be made concerning the type of soap and powder used and the kind of clothing worn, and all possible errors corrected. In cases where the

involvement is extensive the patient is often benefited by substituting salt or bran baths for the usual soap and water. Then the diet should be gone into and carefully regulated. Many cases in breast-fed infants respond favorably if the interval between nursings is lengthened and the time of nursing decreased. In artificially fed children the sugars in the formula are frequently at fault. Finally the disease should be treated locally by the use of salves and lotions. Many of the ointments on the market for eczema are too strong for the tender

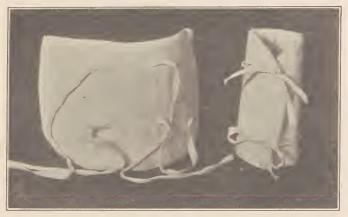


Fig. 22.—Splints for the Elbows. These are covered with canton flannel and have tapes conveniently arranged for tying.

skin of the infant and tend to make matters worse rather than better, so that the choice of the preparation to be used must always be left to the physician. Often in bad cases of facial eczema it is necessary to apply some type of covering to keep the salve on. For this purpose a mask made of muslin with holes for the eyes and mouth, which can be held snugly in place, is valuable. Where the condition is made worse by scratching, some method of restraining the hands is necessary. Splints made of stiff cardboard covered with cloth and provided with tapes so that they can be tied around the elbows are excellent where the eczema is of the face only. When other

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parts of the body are involved it is sometimes necessary to fasten the arms to the sides either by pinning the sleeves to the diaper or by specially devised wristlets which may be fastened to the bed.



Fig. 23.—Splints Applied. These are used to prevent scratching in eczema of the face.

INTERTRIGO

This is a special form of eczema found most commonly in fat babies. It involves those areas where two skin surfaces rub together as in the folds of the neck and between the thighs. The skin becomes reddened, somewhat thickened and oozes a colorless sticky fluid. Itching and burning is intense and, when the napkin area is involved, each time the child voids he suffers severely.

Treatment.—When in the folds of the neck, the condition can often be relieved by cutting crescents of old linen, much

the shape of dress shields, rubbing them with fine cornstarch, and laying them between the inflamed surfaces. When the napkin area is involved, the problem is more difficult. In the first place the child must be kept clean and dry. It is usually necessary to change him several times during the night. No soap or water should be used in cleansing him, olive oil on soft cloths being substituted, except at his morning bath. Finally for an hour, morning and afternoon, he should be left without his diaper in a warm room, preferably lying on a pad in bed, so that the air can dry the affected area. Particularly stubborn cases may be treated with ultraviolet rays.

SEBORRHEA

The oily dirty-looking scales which frequently form on an infant's scalp are due to seborrhea. While usually free from danger, the condition is unsightly and, if untreated, is apt to spread. A satisfactory treatment is to rub the scalp for three mornings with olive oil, on the fourth morning a thorough shampoo is given and the scales gently removed. The scalp is then carefully dried and a little sulphur ointment rubbed in. At the end of a week the whole treatment is carried out again. Usually three courses are necessary for a permanent cure.

MILIARIA

This disease is due to stoppage and irritation of the sweat glands. The most common form is generally known as "prickly heat" and is caused by hot weather or overclothing, particularly where wool is used next to the skin. It consists of small bright red papules occurring in patches usually on the neck, over the chest and between the shoulders. It itches badly and this may lead to scratching and infection.

Treatment.—This consists in light, non-irritating clothing,

frequent bathing with bicarbonate of soda solution, and powdering with stearate of zinc or starch.

There is another form of miliaria which appears upon the cheeks and across the bridge of the nose in many infants at two or three months of age. It consists of scattered pinhead-sized whitish papules. Often these become inflamed and turn red. The condition is harmless but unsightly and can usually be relieved in a few days by gentle massage with cold cream.

IMPETIGO CONTAGIOSA

Impetigo is a bacterial disease of the skin. It is most common in the poorly nourished and in institutions where it is highly contagious. The disease often starts from an infected burn or cut. The child picks at the crust which forms, getting the germs under the finger nails. Then wherever he scratches, the germs are deposited and new lesions develop. The lesions consist of vesicles filled with grayish fluid. These break and dry, leaving dirty brown crusts. After a time these crusts fall off, leaving no scars. The disease attacks only the outer layers of the skin as a rule, and the lesions are surrounded by little or no red area of inflammation. Sometimes, however, in poorly cared-for infants, deep infection takes place with the formation of ulcers or furuncles. The treatment, which works as though by magic, consists in applying white precipitate ointment, one-third standard strength.

FURUNCULOSIS

Furunculosis is often secondary to eczema, impetigo or miliaria. It occurs most frequently in poorly nourished infants. The disease consists of pockets of pus which form under the skin, usually of the scalp, but in severe cases all over the body. The furuncles vary in size from the head of a pin to the size of a dime. The swellings are soft, flabby, and usually sur-

rounded by but little redness. If one is allowed to break, it is usually followed by a crop of others, wherever the pus from the first one has touched. The treatment consists in cleanliness, opening of the lesions, and vaccines made from the bacteria recovered from the furuncles themselves. Special care should also be paid to building up the patient's general health, thus increasing his resistance.

SCABIES

Scabies is a parasitic disease frequently seen in dispensary practice. It is readily transmissible so that usually all of the members of an infected family have the disease. The lesions are caused by a minute insect, the Acarus, the females of which burrow under the skin, laying their eggs as they go. This causes itching and scratching with secondary infection. The arrangement of the lesions in lines, following the course of the burrows, is characteristic. In adults the disease is most common where the skin is thinnest, particularly between the fingers; but in infants, whose skin is everywhere tender, the lesions may be found anywhere. In nursing infants the disease frequently starts on the face, which has become infected from the breast of the mother. The treatment consists in a bath with hot water and soap, followed by the application of sulphur ointment, 10 per cent. This ointment is applied for several successive days, at the end of which time the patient is again bathed and fresh clothes put on. All bed linen and underwear which may have become infected must be boiled. It is useless to treat one member of an infected family without treating them all, as the patient will presently become reinfected. After the treatment with sulphur ointment has destroyed the parasites, some mild treatment such as boric acid ointment is often necessary to counteract the inflammation and the superficial infections.

PEDICULOSIS

Of the three forms of pediculosis, only the form which attacks the head, the pediculosis capitis, is common among children in this country. The head louse lives among the hairs of the scalp and lays its eggs upon the hairs. These nits are minute pearl-like bodies glued tightly to the hair; they can thus be differentiated from flakes of dandruff because, unlike the latter, they will not slip along the hair. Aside from the presence of pediculi and nits, the symptoms are itching of the scalp and swelling of the glands at the border of the scalp. In neglected cases infection takes place, with the formation of crusts and matting of the hair. The disease is more common in girls than boys and is frequently found in institutions, where its elimination is often a difficult problem. There are many forms of treatment, the simplest of which is to soak the scalp with crude petroleum and apply a dressing to keep it in place. After twenty-four hours the scalp may be shampooed. Dilute acetic acid or vinegar is useful in loosening the cement which holds the nits to the hairs. In some institutions all of this trouble is obviated by the wholesale use of clippers. Every child admitted to a hospital or other institution should have the scalp carefully examined and, if found to be infected, should be isolated until the scalp can be cleared by treatment.

CHAPTER XX THE NEUROTIC CHILD



CHAPTER XX

THE NEUROTIC CHILD

In our present-day complex civilization the nervous child is coming to be more and more in evidence. He forms a difficult problem for his parents, nurse, and physician. If his condition is allowed to go on unchanged he grows up a trial to himself and to his associates. Nowhere is so much patience necessary or so much gentle firmness demanded as in handling these children. Each presents his own particular perversions of thought or habit, but the underlying elements of willfulness, selfishness and lack of restraint are present in them all.

Heredity and Environment.—How much of a child's disposition is inherited from his parents and how much is later acquired from them by daily association is hard to say. Certainly nervous instability is a trait which runs through generations in some families. On the other hand, when one sees how a nervous, irritable child becomes quiet and placid when put in well-ordered surroundings, one cannot help feeling that the neurotic child is what he is because he is brought up by neurotic parents. Probably both factors play a part.

Children react amazingly to the state of mind of those about them. If the parents or nurse are worried or harassed or fatigued, the child feels it and is irritable and contrary. The nagging parent is rewarded by a nagging child. The overindulgent parent is perhaps even worse, for the child becomes willful and selfish, and when not given his own way is apt to go off into fits of uncontrollable temper. When parents learn that they cannot tell falsehoods to children without losing the confidence of the child, they have eliminated a great source of

difficulty. The statement "Don't do that or mother will spank," when disobeyed and not followed by the promised spanking is like the cry of "Wolf, Wolf," and soon leads to a total disregard of the parent's commands. This is especially true of those who have unpleasant duties to perform for children as is the case with nurses and doctors. "This won't hurt," when you know it will, betrays the child's confidence and makes all future dealings with him difficult. It is far better to say, "This is going to hurt. I want you to be a brave fellow and not make a fuss." Then when you tell him something else is not going to hurt, he will believe you.

Discipline is absolutely essential if one is to avoid having a nervous child. By this I do not mean corporal punishment. Discipline must begin with the parent himself. It is useless for a father to scold his son for not hanging up his coat and hat when he comes in, if the father himself flings his things on the first convenient chair when he enters the house. And no amount of punishment will make the boy really orderly under such circumstances. Discipline, then, must come through activity properly directed, not through restraint and punishment.

Need of Play.—Children have the unbounded energy of all young creatures and the outlet for this energy is play. Play should not be regarded as a waste of time but as a necessity. It is the serious business of a child's life. For proper play three things are necessary; other children of about the same age, a place to play, and suitable things to play with. An only child without playmates seldom develops normally. When a mother tells me that her child will not stay outdoors and play, I am usually right in assuming that she will not let him play with the other children in the neighborhood. Likewise he must have a place indoors and one outdoors which he can consider his own, and where he and his comrades can play their own games without interference. And he must have things to play with. The mother who complains that her son is a bad, de-

structive boy and has ruined a valuable set of furniture with his new Christmas saw, is quite taken back when asked why she has not found him some soft lumber with which to work. Playthings need not be expensive or elaborate. A doll house built, under supervision, by the girl herself out of soap boxes is enjoyed far more and is more instructive than the most perfect one her parents can buy. The child needs this outlet of play, and lacking it turns his energies to less wholesome channels.

Each nervous child presents a different problem with different underlying causes. There have been given only the merest suggestions of the factors in the family and in the home which are important. There are many other influences which play upon the nervous development of the child, his school, the bustle and noise of the city streets, the motion pictures. This last is mentioned because there has sprung up within the last few years a special type of nervous child from among those who frequent the moving pictures. All of these things may be factors in producing nervous children and, in the case of the nervous child, must be inquired into at length.

CHARACTERISTICS OF THE NERVOUS CHILD

Physically the neurotic child is usually poorly nourished. His appetite is fickle and his digestion frequently upset. He notices hurts which the average child would disregard. Often he will complain that his clothing is uncomfortable, in particular he dislikes anything about his neck. He sleeps poorly and complains of his dreams. Usually he is bright and his mind active, but he tires easily. All children lack concentration and the faculty of sustained effort, but in the nervous child this lack is especially noticeable. He is affectionate and jealous but subject to sudden changes in his likes and dislikes. These children fall easily into bad practices which soon become

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fixed habits. A few of these habits which are the most common are taken up here.

Thumb-sucking.—A certain amount of sucking seems natural to all children, and becomes objectionable only when persisted in after the first year, or carried out in some unusual manner. If not corrected many children will continue sucking well into their school days. If the effort is then made to correct them they become deceitful and sullen, stealing off at every opportunity to suck the thumb in solitude. As an example of a pernicious form of sucking, some children suck the first two fingers, inserting them with the palm forward. This brings strong pressure upward on the hard palate and teeth so that it soon changes the shape of the mouth. In consequence it is always better to prevent the formation of the sucking habit or overcome it before it becomes firmly fixed.

In my experience the most humane method is to cover the hands with bags made of unbleached muslin, which can be drawn on like mittens and pinned to the sleeves. Most children will not put this material in the mouth, while they will all others, and in a few days or weeks have forgotten the thumb. In some cases cardboard splints on the elbows are satisfactory. Bitter substances painted on the fingers are useless, the child usually sucking off the quinin or aloes with much relish.

Nail-biting.—A similar habit in older children is that of biting the nails. This is particularly common in children who are for any reason much shut in the house. It is an annoying practice to watch, and spoils the shape of the fingers. It is a difficult habit to overcome. The general condition of the child must be improved as far as possible and active outdoor play encouraged. Punishments are useless as they are in all of these conditions; rewards, however, often produce results. A manicure set will sometimes bring about a speedy cure in a girl as it encourages her to keep the nails looking well.

Masturbation.—It is very much a question whether frequent

masturbation produces mental deterioration, or whether the mentally deficient child is the one who becomes the confirmed masturbator. At any rate the two conditions often exist together. Even babies and very young children of both sexes may be victims of the habit which they practice in various ways. Every effort should be made to prevent the development of this habit by checking it at the start. Once it becomes fixed, an entire change of surroundings, associates, and activities is sometimes necessary to break it.

Breath-holding.—A peculiarly distressing habit which occurs in the spoiled child is holding the breath. The child, if not allowed to have his own way, starts to cry. After a moment or so he draws in his breath in a series of convulsive gasps, and holds it until in a few seconds the lips become blue and then the whole face becomes dusky. After what seems like many minutes, though in reality it is usually only thirty seconds, there is a prolonged cry and the normal color returns. Sometimes at the height of the cyanosis the child faints, whereupon breathing is recommenced, and in a few seconds consciousness is regained. The treatment of the attack is to splash cold water in the face, if that is at hand; lacking that, the child may be given a sharp slap on the buttocks. Cure of the underlying condition lies in reëducating the child to the point where he realizes he cannot always have his own way.

Rumination.—A dangerous and often fatal habit in infants is rumination. It consists in bringing a mouthful of food up from the stomach, chewing it for a time, and then swallowing it again or spitting it out. The food is brought up by a peculiar backward and forward working of the lower jaw. As the habit progresses, more and more food is brought up at a time, until after a few weeks a bottle is hardly taken before it is vomited. These children are often very sly in their ways, apparently realizing that they are doing something wrong. As long as they are watched they refrain from working their jaw, but once they think they are unobserved the process com-

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Fig. 24.—Ruminator Cap. This cap is made of heavy muslin. The lower bands cross on the point of the chin. They are drawn tight, and tied securely to the upper tapes.

mences and vomiting takes place. No change in diet has any permanent effect on the vomiting, as it does not depend on indigestion. If allowed to continue, the habit frequently

proves fatal, as the child does not retain enough food to sustain life. Treatment consists in applying a tight binder to the head in such a way that the chin cannot be moved. This is adjusted as soon as a bottle has been taken and is kept in place for three hours, during which time the food has had time to leave the stomach. The cap is then removed and the child given an hour's rest before the next feeding.



FIG. 25.—RUMINATOR CAP APPLIED.

Enuresis.—Most children by the time they are a year and a half old have learned to keep dry during the day. By the time they are two and a half they will usually stay dry at night, if picked up at ten or eleven o'clock. When a child has not learned to keep dry at a reasonable age, he is said to have enuresis. This is divided into two types, diurnal and nocturnal. Sometimes enuresis depends upon some physical irritation, such as a tight or inflamed foreskin, a vaginitis or the presence of pin-worms. Occasionally it depends on habits of eating or drinking—salty food for supper with a consequent drinking of large amounts of water before retiring, naturally predisposing to bed-wetting. It may at times depend on a

generally run-down condition in children of nervous temperament. But the great majority of cases are the result of habit. The parents have either neglected to train the child properly, or they have not known how to go about the training.

In both types of enuresis the general health of the patient should be brought up to the highest possible point and any local conditions corrected. The urine should be examined and, if this be a cause of irritation, steps should be taken to correct the fault. With these matters attended to, the actual treatment commences. This is tedious and requires much time. One notices first how often the child wets himself. Let us say that it is every twenty minutes. Every twenty minutes, then, throughout the day he is placed upon the chamber and encouraged to void. After he has stayed dry for three days, the time is increased to twenty-five minutes, and so on until he is staying dry for an hour and a half or two hours. this time he has usually learned enough control so that if for any reason he needs to urinate before the allotted time is up, he can overcome the impulse until he can reach the chamber. This routine gradually increases the capacity of the bladder and teaches control of the sphincter. When this control is acquired during the day one can begin the treatment of nocturnal enuresis with some hope of success, but not before. In starting the night training one should first make it as easy for the child as possible by regulating the intake of fluids. A satisfactory plan is to give all the fluids the child wants up to four-thirty in the afternoon, after which time none are allowed, not even with the supper, which is dry and free from salty or highly seasoned food. Just before being put to bed, the child is made to void. He is wakened and made to void again about ten. If experience shows that he is wet at that time, one must get him up sooner. Most children will then go through to four or five in the morning at which time they must again be picked up. After a few weeks the early morning voiding can usually be postponed till rising time. Relapses frequently

occur, particularly if the child has a cold or other minor ailment, whereupon one must patiently begin over again with the education.

Speech Defects.—Lisping.—Lisping and the use of baby talk occasionally depend on difficulty in breathing or on abnormalities of the throat, tongue or teeth. More often, however, they depend on faulty training.

Many parents encourage these habits in their children by copying them, instead of trying to train them to speak distinctly. The treatment consists primarily in always speaking clearly and slowly to the child. Further, he should have a few minutes training each day upon the sounds which for him are difficult, usually s, th, and r. It is far better to give him an intensive lesson of ten or fifteen minutes and leave him in peace the rest of the day than to be constantly correcting him.

Stammering.—Many nervous children between the ages of three and six have short periods of stammering which, while not serious, fill the parents with apprehension. The condition can usually be overcome by insisting that the child speak slowly. He stammers only because his thoughts get ahead of his tongue. The real stammerers, on the other hand, have no such hope of easy cure. Special schools help many of them, although the majority slip back into their old ways when out of the routine of the school.

Tics.—Tics are purposeless movements which have been carried out so frequently that they have become fixed habits. We all have our pet tic which goes with us through life. It may be a clearing of the throat when embarrassed, a stroking of the ear when in deep thought, or an almost irresistible impulse to step on every crack in a given stretch of sidewalk. But the nervous child, instead of one or two, has a dozen tics and is constantly changing his assortment. For a few weeks he may be constantly drawing down his upper lip over the lower, then perhaps he will start hitching up one shoulder, and so on, until his parents and teachers are in despair. Treat-

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ment is difficult because correcting the habit fixes the child's attention upon it and tends to make it more lasting. Punishments are of no avail, nor are rewards for the same reason. Treatment then must be along general lines, building up the general health by means of outdoor exercise and plenty of sleep. The child's time must be taken up with interesting occupations. And finally he should not associate with those who are afflicted like himself, because such association leads to the acquiring of new tics by imitation.

Pica.—The habit of eating unusual things such as dirt and chalk is called pica. Often such a perverted appetite is an indication of a faulty diet, but sometimes no such basis can be found. The seriousness of the habit depends upon the substance which the child elects to eat. Grass or shavings or soap may do little or no harm. Hair and thread, on the other hand, have a tendency to form in time a large ball in the stomach which finally impairs digestion and necessitates an operation. One of the most common and perhaps the most dangerous types of pica is paint eating, common because the child lives in a paint encrusted environment, and dangerous because of the lead of which the paint is made. Lead poisoning manifests itself in anemia, vomiting, a bluish line of deposited lead in the gums, and, in advanced cases, convulsions and death. Infants who eat paint should be in cribs of natural wood or of metal painted with zinc paint. Older children usually chew the paint from the sill while looking out of the window. They require constant watching to correct the habit.

CHAPTER XXI THE CONVALESCENT CHILD



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THE CONVALESCENT CHILD

The child who is recovering from a long or debilitating illness presents many problems for the nurse to solve. Strictly speaking, this group would be a relatively small one, but there are other children whose care is so closely related to the convalescent that they may be included in this chapter. These are the children with the milder forms of heart or kidney disease who do not feel sick, and who still have not the strength to romp and play as do normal children. Also in this category come patients who are much under weight, whether from faulty care, from latent tuberculosis or some other such cause. These children are all bankrupt physically, and the task is to bring them up so that they not only have enough strength for the day's needs but have a reserve which may be drawn on in an emergency.

Mental State.—Most of these patients are very unstable nervously. They are fussy and exacting. If one caters to their wants they become little tyrants, making every one about them miserable slaves. If they cannot have their own way they frequently fly into a rage and scream till exhausted. And so one must steer a middle course between overindulgence which results in a spoiled child and too great strictness with its resulting tantrums and fatigue.

Physical State.—The characteristic feature of these children is the ease with which they tire. If in bed, they constantly interrupt their play by dropping back on the pillows for a few moments rest. When they are allowed up, one must remember this, and make the first excursions from bed brief, only increasing the time as the child's strength returns.

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Rest.—The one most important factor in the care of the convalescent is rest. In order that this shall be as complete as possible it must be made comfortable. For the child in bed, care must be taken to remove toys and heavy books from the covers when he settles himself for a rest or nap. Where possible he should be moved occasionally to another bed, so that his may be aired and remade. After each meal, all crumbs should be carefully brushed from the bedding. If he wears a robe while sitting up to play, this should be removed when he lies down. Once or twice each day at definite times there should be regular naps. For these the room should be partially darkened and the windows opened as much as the weather will allow.

For the child who has improved to the runabout stage, there should be a long rest after the midday meal. With some children one need only remove the shoes and loosen the outer clothing and cover them with blankets. Others will not rest in this way, and must be put into their night clothes and regularly put to bed. An hour should be the minimum after-luncheon rest for any of these children. It should be remembered that the child will rest much more completely if alone. Persons moving about or even sitting quietly in the room distract him and keep him from relaxing.

Bathing and Massage.—We know far too little of the effects of baths upon the system. But certainly a warm bath is soothing and is helpful in inducing a peaceful night's sleep. And in some children a cold shower in the morning is invigorating. This latter should be used with care, however, and should never be tried without the definite order of the physician. Gentle massage once or twice a day is of considerable value with children who have long been confined to bed.

Food.—It was said of the normal child that he must never be urged to eat. This does not apply with the same force to the convalescent child. While actual forcing of food leads only to gagging and vomiting, one can often increase the child's interest in his food in ways which help rather than hinder his digestion. His toast may be cut with cookie cutters into various amusing shapes. Milk often tastes far better through a straw. A few vermicelli letters will often dispose of a cup of broth which might otherwise go untouched, and so on. Children often eat better with others than alone, so that a "tea party," with mother and nurse as guests, is often an excellent appetizer. A variation is a doll's party with food served on the doll's tea set. For a hundred tempting dishes see any book on dietetics. But remember that two small portions are as much as one large one, and are twice as well taken. It is usually a mistake to give frequent feedings even to the child who is taking but little at a time. Four meals a day at stated intervals are all that are necessary.

These children, with the exception of certain of the heart and kidney cases, are usually benefited by increasing their fluid intake above the normal. To this end, water and fruit-juice drinks are desirable. Orangeade and limeade may be made with charged water for variety's sake. Grapejuice with a little lemon and cracked ice sometimes goes well. Older children often enjoy an occasional small glass of ginger ale.

Entertainment.—As the child's strength returns he will spend less and less of his time simply resting and one must find amusements for him. He cannot play actively all of the time he is not resting, and to avoid boredom he must be entertained. All children love stories, whether told or read to them, provided the stories fit the age and the temperament of the child. They demand repetition and would rather hear the same favorite story over and over than to be always told new ones. Simple tales of everyday happenings please a child more and are less apt to make him have bad dreams than fantastic fairy tales. For this reason Robert Louis Stevenson's A Child's Garden of Verses is especially loved by children. There are many good lists of books for children of various ages. One which has proved very satisfactory is A Mother's

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List of Books for Children by Gertrude Weld Arnold. When it comes to the manner of telling, Sara Cone Bryant's How to Tell Stories to Children is most helpful. When one's voice gives out, the phonograph may be called upon. There are barnyard records, bird songs, and fables to please children of all ages. For children who like animals, the right kind of a dog will while away many otherwise weary hours.

Play.—When the child is well enough to sit up and play, he should be comfortably gowned and propped up with pillows or a back rest. A bed table is almost indispensable. A fairly satisfactory one may be improvised from a lapboard and two empty shoe boxes. One should be careful not to litter the bed with numerous toys. One thing at a time is enough, and when this is tired of it should be taken away and another substituted. Blocks are unsatisfactory, as a bed table at best is unstable and a change in position may cause an earthquake which destroys a carefully erected building, much to the child's sorrow. Toy villages of light wood are, for this reason, much to be preferred. For a like reason, painting, with its inevitable cup of water, is dangerous, and should be replaced by work with colored pencils. Many of the cut-out toys are entertaining, but one should avoid the more complicated ones, and especially those in which there is much pasting, as the paste seldom holds well and the child is annoyed by his failure to reach perfection. There are games almost without number for older children to play. The only danger is that the child may tire himself out in his excitement. So one must watch carefully and stop him before he becomes fatigued.

The child who is well enough to be up and about the room enjoys building-blocks. He may also sit at a table and model with clay or one of its substitutes. Painting and blowing soap bubbles are both applicable at this stage. For numerous other suggestions one may see Dorothy Canfield's What Shall We Do Now?

Education.—In some conditions convalescence is so pro-

tracted that the child's schooling is definitely interfered with, and some means must be taken to make up this deficiency. This is particularly true of orthopedic cases. For such children a hospital school where they can be both treated and taught is highly desirable. For children at home the Calvert School has an admirable system for guiding the mother or nurse in teaching the child.

Fresh Air and Sunshine.—Fresh air and sunshine are such wonderful tonics that one should make use of them wherever possible with convalescent children. In good weather the bed may be rolled out on to an open balcony or porch. Later the child may have his play table on the porch or lawn. When out-of-doors he must be watched for evidences of fatigue even more carefully than when in the house and must be made to rest if these appear. When the season of the year makes out-door activities unwise, it is sometimes advisable to move the patient to a warmer climate.



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